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Infra-Red Processes Gain p. 110

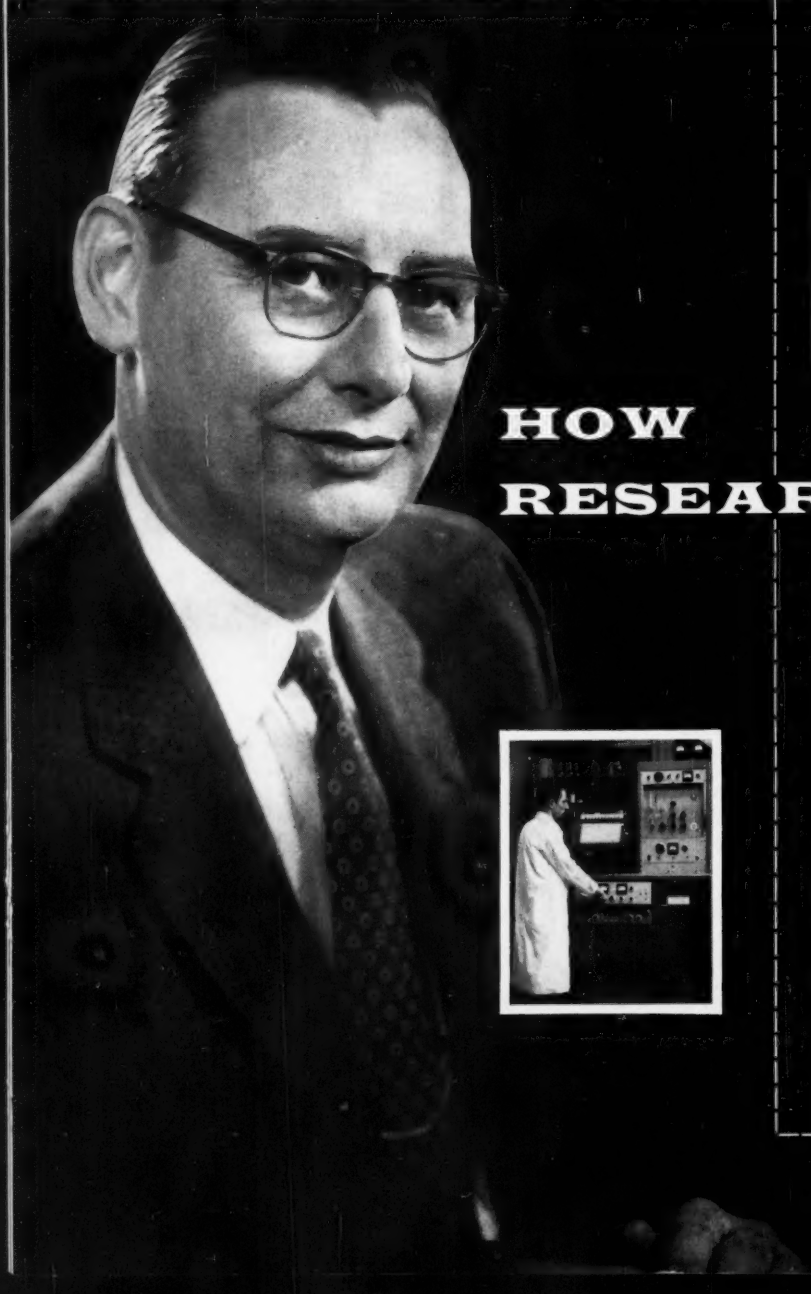
FEBRUARY 1958

$1.00

FOOD ENGINEERING

FOR MANAGEMENT
IN MANUFACTURING,
PACKAGING, MARKETING

A McGRAW-HILL PUBLICATION



HOW RESEARCH SPARKS BUSINESS

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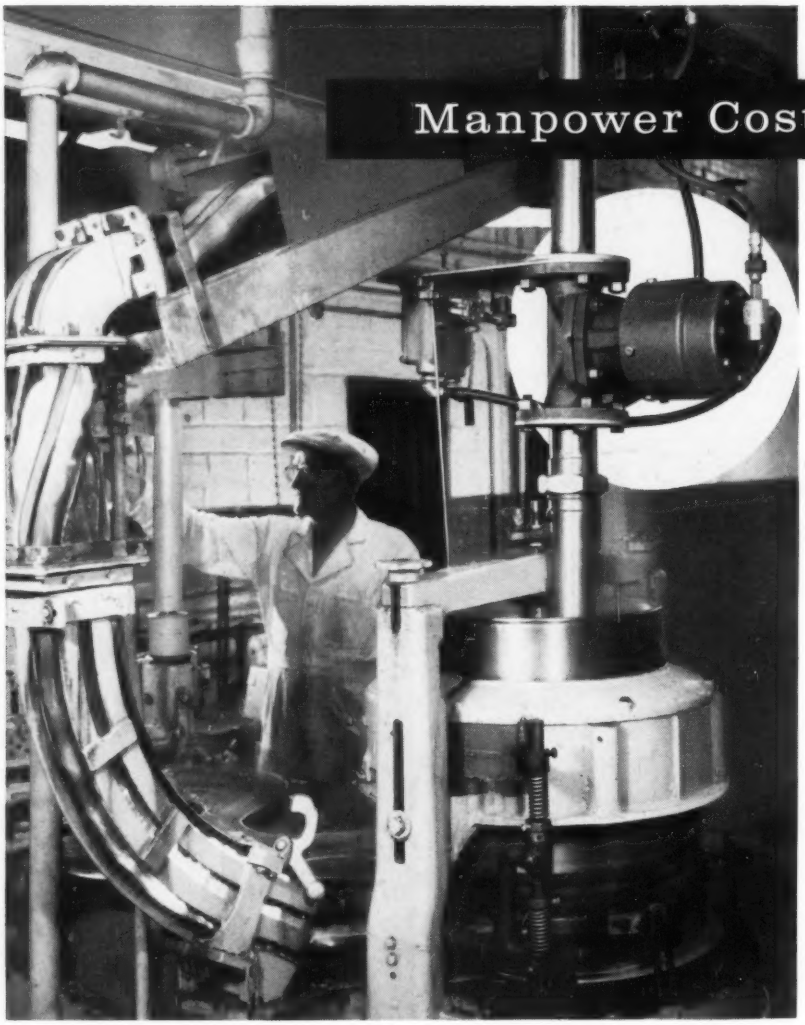
Roy H. Walters, General Foods Corp.



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GRINNELL-SAUNDERS DIAPHRAGM VALVE

AT ALBERS MILLING COMPANY, A DIVISION OF CARNATION COMPANY. When meat in canning vat is almost used up, float activates an *automated* Grinnell-Saunders Diaphragm Valve. Valve opens permitting a fresh supply of food to come down from floor above. Operation is at rate of 12 cycles a minute, 8 hours a day, 5 days a week — at 190°F.

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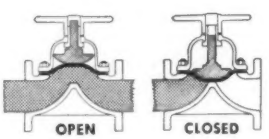
Grinnell-Saunders Diaphragm Valves can be supplied for both handwheel and quick-acting lever operation, as well as power operation. They are available with body, lining and diaphragm materials to meet practically every requirement. For details, write Grinnell Company, Inc., 277 West Exchange Street, Providence, Rhode Island.

GRINNELL

WHENEVER PIPING IS INVOLVED

Diaphragm lifts high for streamline flow in either direction.



Diaphragm presses down tightly for a positive, leakproof seal.

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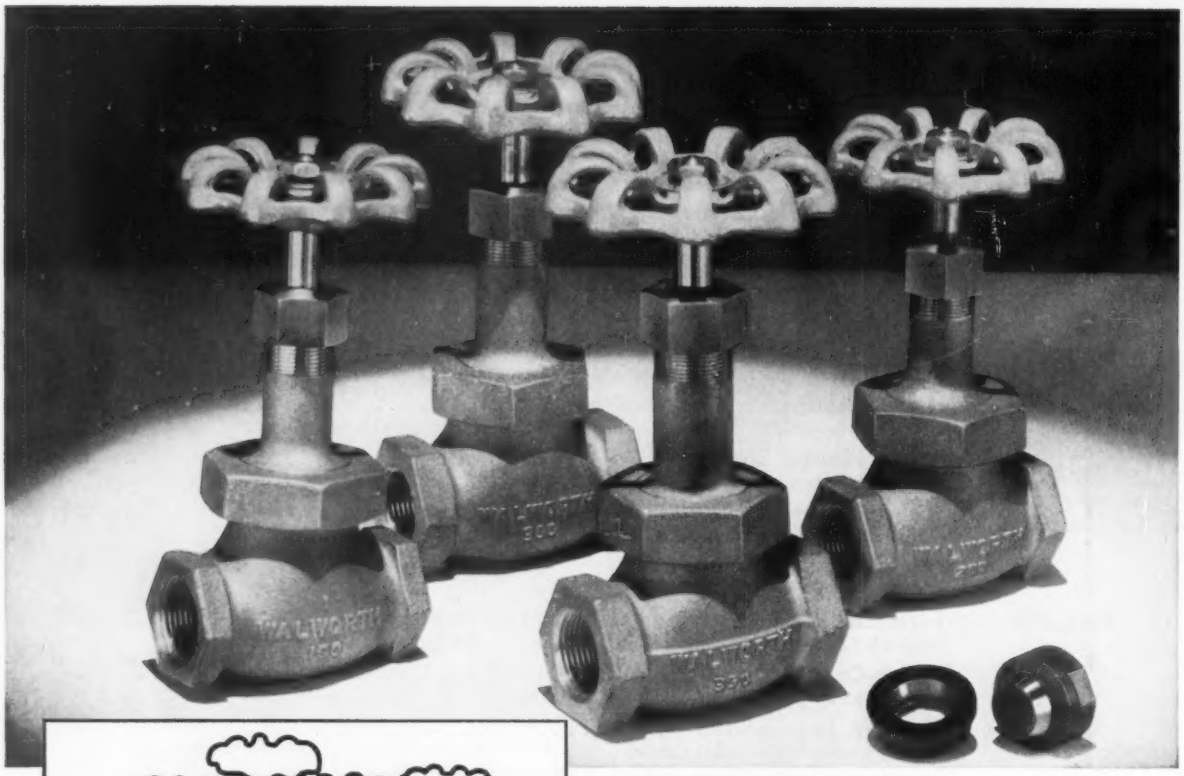

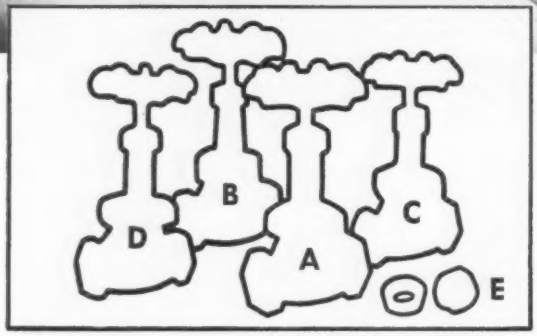

A — No. 225P.....350 WSP 550F, 1000 WOG
B — No. 260P.....300 WSP 550F, 600 WOG
C — No. 245P.....200 WSP 550F, 400 WOG
D — No. 237P.....150 WSP 500F, 300 WOG
E — "500 Brinell" Stainless Steel Plug Type Seat and Disc

Walworth offers four lines of Bronze Globe Valves with stainless steel, plug-type seats and discs. Advantages of these valves include:

• **Stainless Steel Plug-Type Seats and Discs,** heat-treated to a minimum of 500 Brinell hardness reduces wire-drawing to a minimum. Seats and Discs are machined and fitted simultaneously, assuring perfect mating.

• **Deep Stuffing Boxes with Glands** are fitted with reinforced, molded packing. Valves can be repacked under pressure when fully opened.

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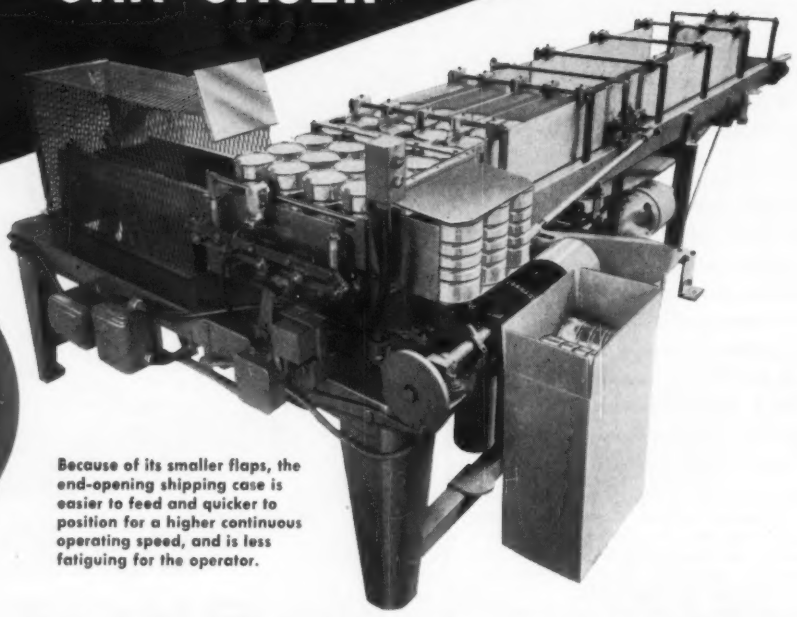
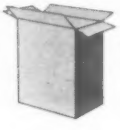


Because of its smaller flaps, the end-opening shipping case is easier to feed and quicker to position for a higher continuous operating speed, and is less fatiguing for the operator.

NON-SHOCK END-OPEN CASER

FOR SINGLE TIER LOADING

46 OZ. AND NO. 10 CANS



With end-opening shipping cases showing a savings of about 15% in fibre alone, no wonder packers using single tier patterns have welcomed FMC's development of this continuous, high speed, automatic caser. Employing many of the key design and construction features of the FMC Model 3 Caser for top-opening cases, this new machine easily handles 1200 cases per hour or more, limited only by the speed of the operator. Cans enter the machine upright, eliminating rolling can impact. As a result, there is no tearing of labels or scratching of lithography; no body dents or split seams. Although used largely for the more common can sizes cased in single tiers (46 oz. and No. 10 cans), the FMC Non-Shock End-Open Caser may also be built for single tier packs of smaller size cans. This machine is a truly remarkable achievement in the field of automatic casing equipment. Write today for complete information, or call your nearest FMC representative.

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TRENDS & FORECASTS

SPECIAL

FOOD ENGINEERING

SERVICE to EXECUTIVES

Gross national product in 1958 is put at $441 billion, up $6 billion over 1957, by McGraw-Hill's Department of Economics. Ups and downs in some industries will vary widely from norm. Food will be up.

Number of production workers in food plants has dropped from 80% of total to 70% in last ten years. Efficiency has increased faster in the plant than in marketing, distribution, and office work.

Average office-worker pay hit a $64-per-week high last year, up $2 over '56, National Office Management Assn. reports. Highest paid is senior bookkeeper ($87). Business machines will cut office costs in 1958.

Cost of plant maintenance is expected to continue upward. It rose 5.5% in year, 68.4% in 10 years, *Factory* reports.

Exports of food in third quarter of 1957 were 10% lower than a year earlier. But for the first 10 months of the year, exports were slightly above the '56 figure because of gains in the first 6 months.

Retail food prices have gone up only 17%, while per capita disposable income has risen 42% since 1947-49, the base period for the BLS Consumer Price Index. The 25% difference is food industry's economic contribution to a higher standard of living.

Government forecasters put 1958 winter wheat crop at 906.3 million bu., up 28% over '57. This points to a total wheat crop of 1.1 billion and a big boost in the 777 million bu. surplus.

Packaging of soft drinks in cans increased 16.2% last year—to 365 million cans—American Can Co. estimates.

Quantity of whole milk bought in half-gallon containers increased 25% between the July-September periods of '56 and '57. The gain for gallon containers was 13%. Trend is to economy food packages.

QO Chief Sees Problem

There has been a trend toward lower inventories, on both the wholesale and retail levels. And Donald B. Lourie, president of Quaker Oats Co., says that the food industry must find ways of maintaining adequate stocks so that the customer can buy what she wants when she goes to the store.

Quaker Oats and other manufacturers have constructed warehouses and distribution centers to speed service in major market areas. And all must continue working cooperatively with distributors to find still other solutions.

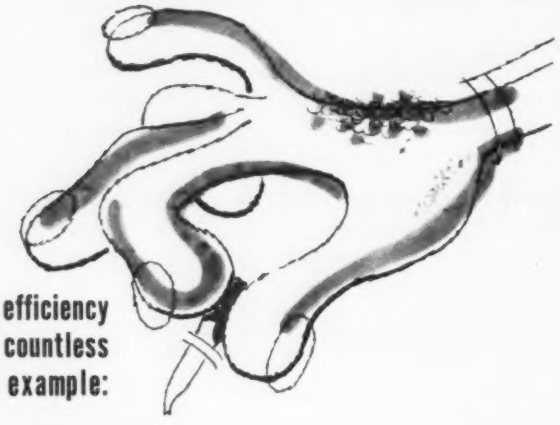
Mr. Lourie looking for a continued increase in sales volume, with no significant change in prices of his firm's products.

A&P President Views 1958

The food outlook for '58, in the opinion of Ralph W. Burger, President of Great Atlantic & Pacific Tea Co., is for continued high production, continued increase in the development and use of convenience

See Developments to Watch p. 17

DOW CORNING SILICONE DEFOAMERS



have proved their efficiency and versatility in countless applications. For example:

1 OUNCE KILLS FOAM IN . . .

- **8,333 lb** meat sauce
- **15,625 lb** dill pickle processing solution
- **35,000 lb** vitamin B_2
- **250,000 lb** molasses

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Trends & Forecasts

foods, and further improvements in stores and service.

But because of continued high living costs, the economy-wise housewife will keep a sharper eye on the 25% of the family budget that goes for food.

We may expect a continued trend toward increased consumption of pre-packaged meats and produce, frozen foods of all varieties, baking mixes, and soluble coffee, Mr. Burger added. The demand for canned foods also will remain strong because of their uniform quality, value, and storage convenience.

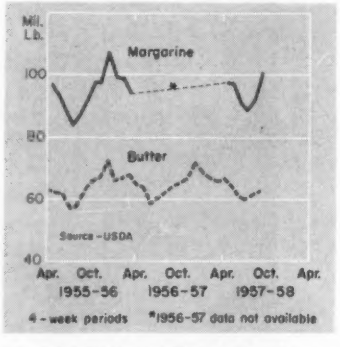
However, the convenience food manufacturers will have to retain quality while seeking new efficiencies that can be reflected in lower prices if they are to expect continued expansion this year.

Savings are possible in warehousing through the development of better equipment that lends itself to automation. Other savings can be sought by streamlining ordering and delivery methods.

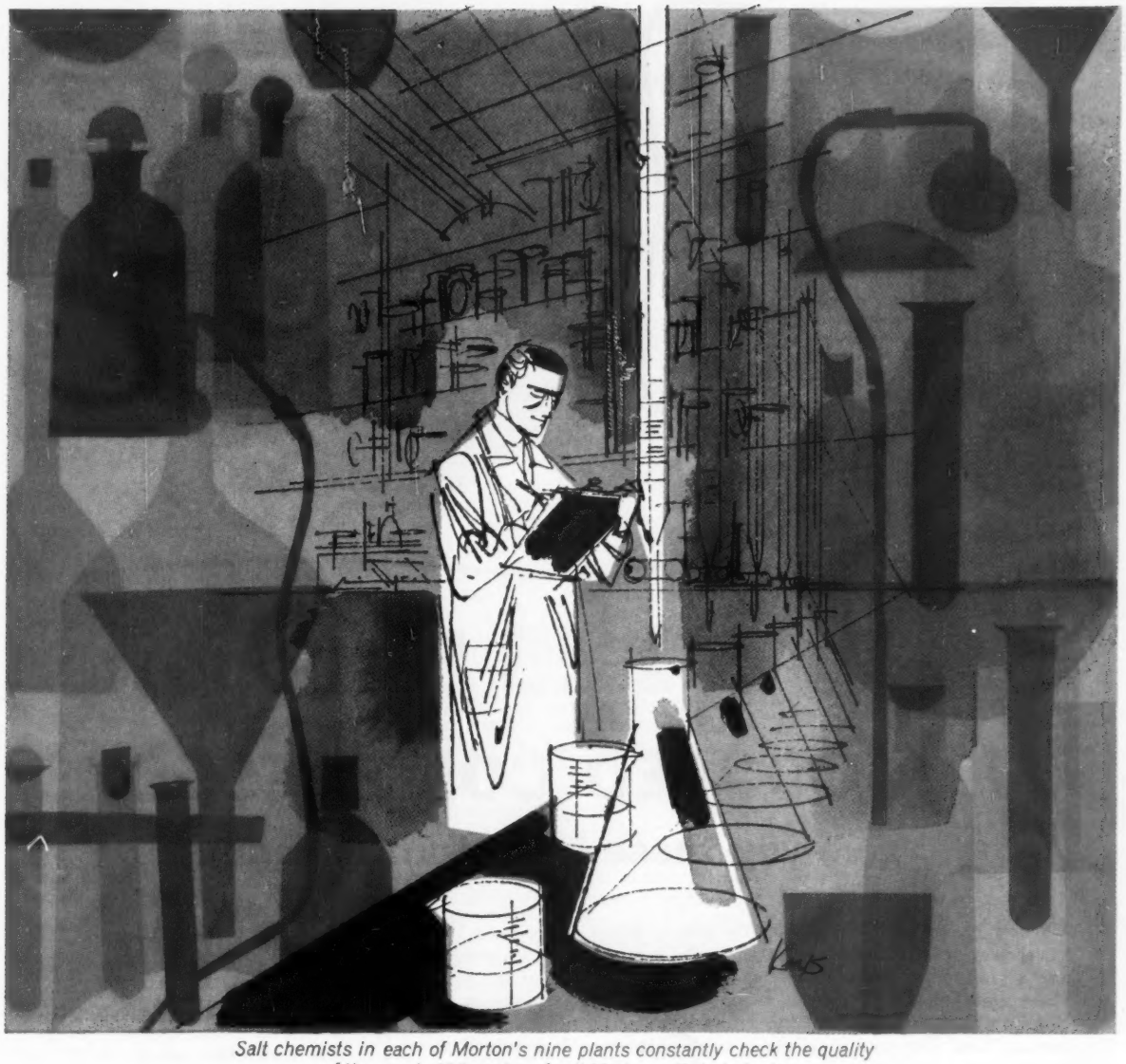
The greatest potential for savings lies in the pre-packaging of food at the point of production, a practice that greatly reduces freight and handling costs and cuts to a minimum the costly spoilage which is a big part of distribution expense.

Processing Vegetables Off 19%

Production of 10 principal vegetables for processing in 1957 was down 19% from the record high of 1956, according to the USDA Crop



MARGARINE GAINS sharply, hitting 103 million lb. for September, 1957—up 12% in two years. Six out of ten families purchased it. By comparison, butter sales in September totaled 64 million lb., down almost 1 million lb. from a year earlier. Margarine prices averaged 26.1c. a pound; butter 69.2c. Housewives are watching prices.



Salt chemists in each of Morton's nine plants constantly check the quality of the nearly 100 grades of salt Morton sells to industry.

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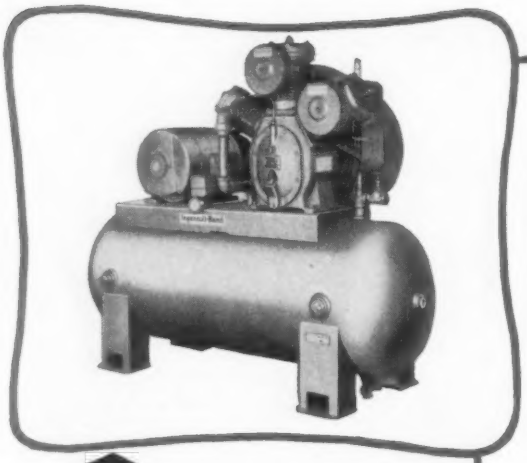

Type 30... A 15 horsepower unit mounted on receiver. Other units, ½ to 20 horsepower.

Type 40... This 125 horsepower Motorcompressor has built-in motor drive. Other sizes from 25 hp.

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TYPE 40 — 25 to 125 horsepower... These efficient two-stage, air-cooled units are available with three types of drive; built-in electric motor, flexible-coupled or V-belt. Dual control permits choice of constant speed or automatic start-stop control. Available for discharge pressures ranging from 80 to 200 psi. Channel Valves are efficient, quick-acting and air-cushioned for quiet operation and long service life.

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Reporting Board. This year's production of 6.75 million tons compares with 8.38 million tons produced last year.

The production of asparagus was 2% smaller. Lima beans dropped 14%, and the output used by freezers was 11% less, while that for canning was down about one-fifth. Snap bean production exceeded that for 1956 by 6%. Both canners and freezers used more than last year.

Production of beets for canning is nearly one-fifth smaller than last year. About one-third less cabbage was used for sauerkraut than in 1956. Sweet corn for freezing held close to last year's level, but that for canning fell off 15%.

Cucumbers for pickles exceeded 1956 by 15%. Green pea production broke previous records. Production for freezing dropped about one-fifth, but the canning crop increased one-sixth.

Processing spinach production increased 3%. Tomato production was down 29%.

More Hot Foods Vended

Sales of hot foods by vending machines tripled last year to reach $6,600,000—from 13,500 machines—according to an estimate by National Automatic Merchandising Assn. In 1956, 6,000 machines sold $2,000,000 worth of hot foods.

Coin-machine sales of coffee, tea, and hot chocolate continued to gain, being estimated at $135 million last year, compared to $109 million the year before for these beverages.

Tomato Pack Down; Beans Up

National Canners Assn. reports size of the canned tomato pack was down 27% last season. On the basis of standard cases of 24/303's, the pack amounted to 26,446,000 cases, compared to 36,457,000 cases in 1956.

Packs of green and wax beans were up appreciably. For canned green beans, the '57 figure is 24,037,962 actual cases compared to 22,391,658 a year earlier.

The wax bean pack was 4,224,833 actual cases, against 3,357,181 in '56.

Peach, Fig Packs Lower

Fewer peaches were packed in 1957, according to National Canners Assn. Production of the can-

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Please have your trained representative call on us to discuss our production problems.

Name .....

Company .....

Address .....

City .....

State .....

UNITED STATES STEEL

For more data, circle this page number on card at back →

FASTEST ACCURACY KNOWN in Moisture Determinations!

NMR

SCHLUMBERGER

Analyzer

Does Complete Test . . . less than 60 seconds . . . within ± 0.1%

This new Moisture Analyzer, based on *N*uclear *M*agnetic *R*esonance, handles moisture tests with incomparable speed and accuracy.

Each test is completed in less than 60 seconds, yet results are consistently reproducible with accuracy within ±0.1%. Unskilled personnel can easily operate the NMR Analyzer on moisture determinations.

Foodstuffs, and other solid material in almost any form, are analyzed by the instrument within a span of seconds for each test.

The Schlumberger Analyzer further improves rapid sampling and testing operations by taking *large* samples, around 35 cc.

The NMR is non-destructive. It makes no change in the material being tested—removes no moisture.

Where operations, such as milling, packaging, grading, or storing, or actual process control, depend on moisture content, the speed of the NMR Analyzer permits tremendous gains in efficiency and control. The NMR Analyzer, whether in the lab or on the production line, will save dollars for your company.

The entire procedure of determining moisture with the Schlumberger Analyzer is accomplished in these three simple steps:

1. Place the weighted sample in the instrument.
2. Flick on the scanning switch.
3. Read off the moisture value recorded on the chart.

FREE: Our new NMR Brochure contains valuable information on this entirely new analytical tool. Please address Department FE for your copy.

For performance reports on how the Schlumberger Analyzer is performing in bulk materials processing call or write:

SCHLUMBERGER WELL SURVEYING CORPORATION *Ridgefield, Connecticut*

Trends & Forecasts

neries totaled 28,135,788 actual cases, compared to 32,364,033 in '56.

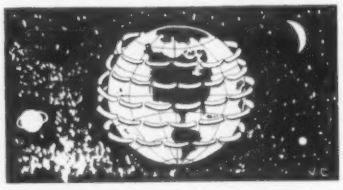
California packed more than 26 million cases. Production in Washington and Oregon was only about one-fourth as much as in 1956, or 371,162 cases.

The 1957 pack of spiced and sweet pickled peaches in California increased to 497,366 actual cases from 422,306 a year earlier.

California's canned fig output totaled 727,134 cases in '57, appreciably lower than the 925,042 cases produced in '56.

HORS D'OEUVRES

▶ To suggest "permission to eat," things like cookies should be shown scattered on package labels, experts say. They were scattered in the old cookie jar, but that's not why we kept going back for more.



▶ A forecaster says that Americans will consume 10.7 billion hot dogs in 1958. End to end, that's enough to circle the world 35 times. If we can't fill the sky with sputniks, we can wrap the old globe in dogniks.

▶ National Baby Week is scheduled for April 26–May 3. Sorry we gave you short notice.

▶ Bad is the business in hog bristles. So bad that the government owns 1,300,000 lb. of bristles that are looking for buyers. And are the taxpayers bristling!

▶ Walls of bubbles from underseas air hoses may be used to roundup herring. Not surprising. People are moved by airy illusions.

▶ Even commonplace foods like sauerkraut will sell through impulse if attractively packaged. And if impulse doesn't lead to remorse, consumers come back for more.

▶ Half of the adults and a fifth of the children skip or skrimp breakfast. How to get people to eat a good morning meal at an average additional cost of 10 cents is a $6 billion a year question.

▶ Saddle-mounted livestock buyers have two-way communication from cattle pens to meat plant offices—via Horsie-Talkies.

Aluminum Foil Packaging-Expansion of Research Facilities

Report No. 13 of a Series by Reynolds Metals Company

REPORT NO. 1 of this series detailed the research staff and the laboratory facilities which provide basic data for these reports. The ever-widening acceptance of aluminum foil materials and the continually expanding range of products being packaged in these materials have, of course, necessitated considerable additions to the laboratory. Now, as the series embarks on its third year, it is important once again to familiarize the reader with the expanded staff and facilities responsible for these technical reports.

Primarily, the basic purposes of this laboratory are: continual evaluation and improvement of performance and economy of currently used aluminum foil packaging materials; investigation and development of all materials used in conjunction with foil (papers, adhesives, inks, coatings, waxes, hot melts, plastic films, etc.); and exploration and invention in entirely new areas of flexible, semi-rigid and rigid packaging with aluminum. This includes the development of associated production type machinery.

Operate Pilot Plant

In order to fulfill these aims, Reynolds maintains not only the packaging laboratory, but also a fully integrated pilot plant for the development and production of aluminum packaging materials. Since the actual use of a product provides still another testing ground for the packaging of new products or the adaptation of existing equipment to aluminum foil materials, technical services rendered right in customers' plants have become yet another important area covered by the Research and Development Department. This technical assistance is available through Reynolds regional representatives.

Newly acquired package testing equipment in the laboratory includes walk-in temperature cabinets, a combination plate and blast freezer, and several different types of in-store display refrigerators and freezers. This is in addition to the spectrophotometer, complete photographic equipment and laboratories, vibration testing machinery, Atlas fadeometer, temperature, humidity and moisture vapor transmission cabinets, and various other paper, film and foil testing apparatus which were detailed in Report No. 1. The laboratory also maintains a test kitchen completely equipped with both gas and electric appliances.

The pilot plant, now housed in an entirely new building, has been expanded with the addition of a 4-color gravure printing press, a plastics extruder and laminator, and new equipment for coating, laminating and spooling foil. Also available are bag making machinery, several different types of heat sealers and other package making equipment which was described in Report No. 1.

The increasing rate of technological advance in several diverse fields of aluminum foil packaging, as well as the enlarged scope of the Department itself, has necessitated a 50% increase in the number of scientists and technicians on the staff.

Results Speeded

Over-all expansion and integration of the laboratory and pilot plant facilities—the world's most extensive 2 years ago and larger than ever today—result in the following benefits to Reynolds and to Reynolds customers:

1. More rapid completion of packaging material development.
2. Faster evaluation of new products and processes.
3. Earlier preparation of sample materials for field testing.
4. Provision of basic manufacturing data to assure success of original production orders.
5. Maximum security in handling customer projects of a confidential nature.

The past discoveries of this laboratory have been significant—among them new data relating the properties of aluminum foil to vacuum packaging, heat conductivity and reflectivity, vitamin and flavor retention, antioxidants, bacteriology, and other highly specialized fields. These discoveries will continue to be reported in this series.

Remember, your local Reynolds representative can place at your disposal the facilities and staff of the world's most complete aluminum foil packaging laboratories. Call him. Or write to **Reynolds Metals Company,** General Sales Office, Louisville, 1, Kentucky.

©Reynolds Metals Company, Louisville, Ky.

Earlier Laboratory Reports

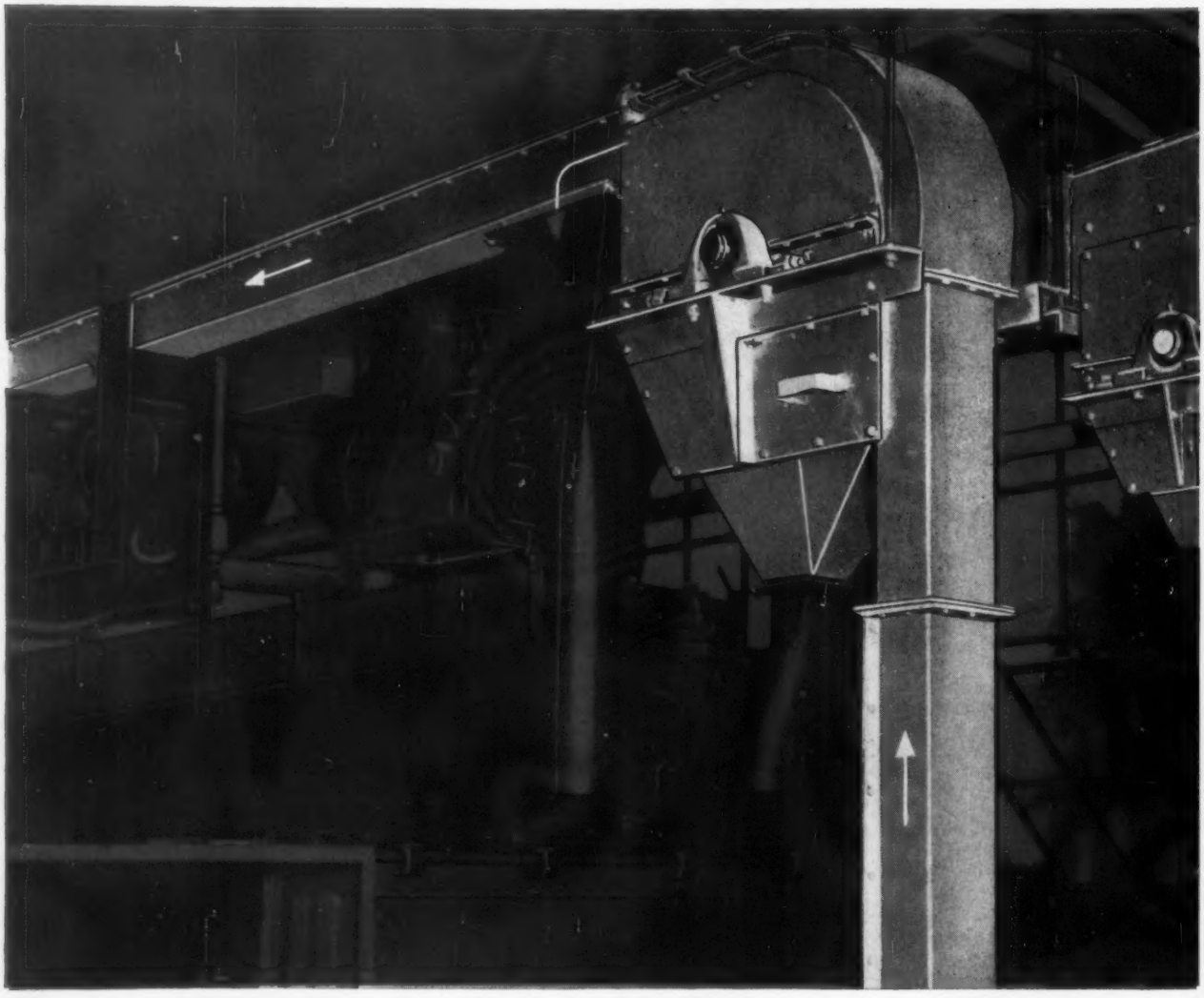
No. 1 Research and Development Laboratories for Aluminum Foil Packaging
No. 2 Aluminum Foil Packaging as a Moisture Vapor Barrier
No. 3 Aluminum Foil Packaging as a Gas Barrier
No. 4 Aluminum Foil Packaging as a Grease and Oil Barrier
No. 5 Aluminum Foil Packaging as an Insulator
No. 6 Aluminum Foil Packaging as a Light Barrier
No. 7 Aluminum Foil Packaging as Protection Against Contamination
No. 8 Aluminum Foil Packaging—Versatility and Compatibility Unexcelled
No. 9 Aluminum Foil Packaging—Advantages of High Thermal Conductivity
No. 10 Aluminum Foil Packaging—Resistance to Insect Infestation
No. 11 Aluminum Foil Packaging—Resistance to Heat and Flame
No. 12 Aluminum Foil Packaging as a Material for Printing

A limited number of these reports is still available. Write for copies you may wish, specifying Report Number.

Watch Reynolds all-family television show "Disneyland", ABC-TV.

For more data, circle this page number on card at back →

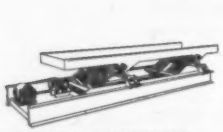
FOR PRODUCT PROTECTION-



Flour is handled by these compact REDLER units, serving two production lines. Since their installation, production has been boosted three times over.

STEPHENS-

THE BIG NAME IN BULK MATERIALS HANDLING



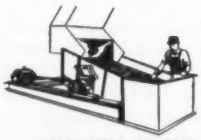
VIBRATING CONVEYORS

REDLER CONVEYORS, ELEVATORS

BIN GATES- ALL KINDS

BELT CONVEYORS

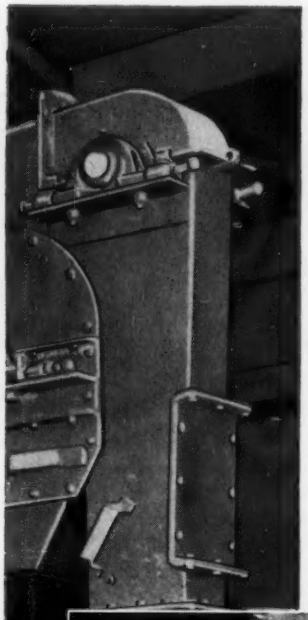
ZIPPER CONVEYOR-ELEVATORS



VIBRATING SCREENS

← For more data, circle this page number on card at back

your best bulk foods handling move

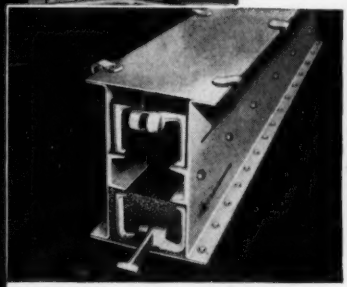


REDLER*

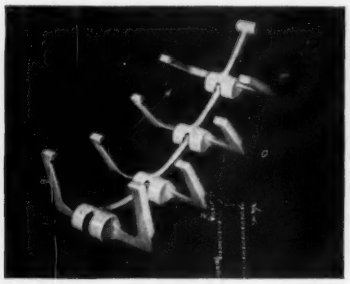
CONVEYORS-ELEVATORS

The REDLER Conveyor-Elevator is one of the most remarkable bulk materials handling machines ever built. It will move practically any pulverized, granular, small lump, or flaky material around corners, over vertical, inclined, or horizontal planes. Material moves forward in a compact column within a totally enclosed, dust-tight casing which virtually eliminates explosion hazards. Material is moved by means of closely spaced skeleton type flights linked together and moving through the casings. Material flows forward in a compact column. A very useful feature of the REDLER Conveyor, is its ability to discharge material at multiple points. When arranged as a horizontal closed-circuit unit, the REDLER Conveyor will re-circulate materials and is often used in packaging or distributing operations.

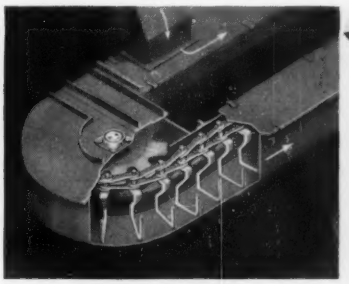
Compact REDLER Conveyor-Elevator designs are available in sizes to handle almost any tonnage. They are quickly and economically installed and their rigid box-girder-like casings are practically self-supporting. For complete data on REDLER Conveyors and Elevators, write for catalog 556.



Cross section thru the REDLER conveyor casing shows material being conveyed in a lower run and the empty flights returning in upper run to complete the circuit. The casing is completely dust-tight, is largely self-supporting and requires very little space. REDLER units are self-cleaning.



Exclusive, skeleton type flights, linked together, are used to move materials forward in a steady, non-agitated flow. REDLER flights, linked together in continuous chain, readily curve around corners permitting horizontal and vertical movement of materials with one unit and one drive.



This view shows a 180° bend section of REDLER horizontal, closed circuit conveyor. The sprocket drives side-pull style chain and flights around the bend. Ley bushed type driving chain is supported in a separate trough — no metal to metal contact in conveying chamber. No drag or scrape.

*The REDLER conveyor is an exclusive Stephens-Adamson product.

-ADAMSON

EQUIPMENT

S-A district or main plant offices can supply complete information on any conveyor product, or any phase of bulk material handling. Call or write for a copy of REDLER catalog 556 for your file.

SINCE 1901 S-A STEPHENS-ADAMSON MFG. CO.

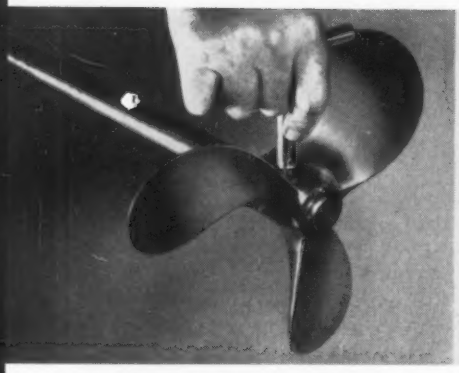
MFG. CO.

MAIN OFFICE AND PLANT
6 RIDGEWAY AVENUE
AURORA • ILLINOIS

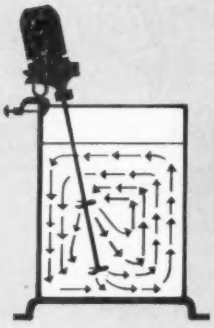
PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA
CLARKSDALE, MISSISSIPPI • BELLEVILLE, ONTARIO

For more data, circle this page number on card at back →

To be sure of **good fluid mixing** *ask yourself these questions:*



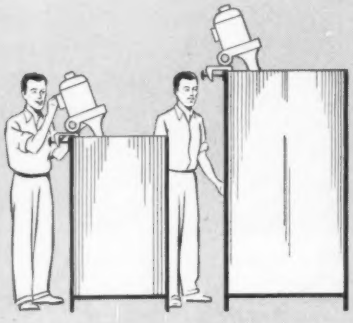
1. Do I need a special impeller to mix fluids? About 95% of food-industry fluid mixing needs can be met with a standard marine propeller. If your mixing problem is unusual, MIXCO will recommend a special impeller to solve it. All types are available.



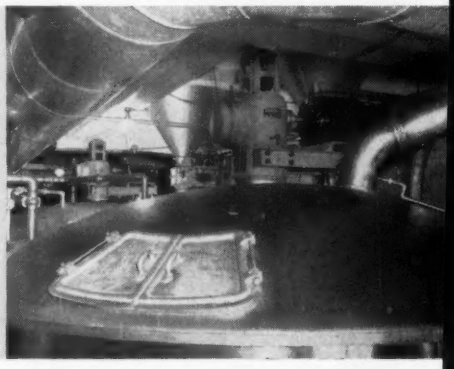
2. What's the advantage of mixing with propellers? You save the cost of baffling. With LIGHTNIN Mixer shaft at this angular off-center position, you get rapid tumbling-rotating action that produces full uniformity, often in a few seconds.

3. How do I get best possible mixing for my product? We *guarantee* that you'll get it with LIGHTNIN Mixers. We carefully select proper model, impeller size, and speed for exact balance of fluid flow and turbulence that gives you optimum results.

4. Can I vary mixing pattern with a LIGHTNIN Portable? Yes. This shaft angle gives you rapid top-to-bottom turnover, ideal for most jobs. Change angle and you get a vortex, good for wetting powders; or a long swirl, useful in washing fibers, gas absorption.



5. Can I get LIGHTNINs now that will meet bigger mixing requirements later on? Certainly. Be sure your LIGHTNINs are sized big enough now to handle the toughest job you'll give them. Later, change only the shaft and propeller to meet new requirements.



6. What batch sizes can I handle with LIGHTNINs? *Any* size! Thousands of gallons can be handled with a portable mixer. Limit depends on viscosity, specific gravity, etc. There's a model for every batch. Here's a turbine-type LIGHTNIN on large brewery mash tun.

7. Where can I get prompt service on fluid mixing? Just call your LIGHTNIN Mixer representative. He can quickly give you a *guaranteed* recommendation. And he's near you—look him up in Thomas' Register or the yellow pages of your telephone directory. Or write us direct.

WHAT SIZE AND TYPE of mixer do you need? Check here for latest bulletins giving full description, packed with helpful facts on mixing:

- ☐ Turbine, paddle, propeller types; top or bottom entering: 1 to 500 HP (B-102)
- ☐ Propeller types; top entering: ¼ to 3 HP (B-103)
- ☐ Portable: ⅛ to 3 HP (B-108)
- ☐ Side entering: 1 to 25 HP (B-104)
- ☐ Laboratory and small-batch production types (B-112)
- ☐ Condensed catalog showing all types (B-109)
- ☐ Quick-change rotary mechanical seals for pressure and vacuum mixing (B-111)
- ☐ Data sheet for figuring mixer requirements (B-107)

Check, clip, and mail with your name, title, company address to:

MIXING EQUIPMENT Co., Inc., 143-b Mt. Read Blvd., Rochester 11, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 10, Ont.

Lightnin® Mixers

MIXCO fluid mixing specialists

DEVELOPMENTS TO WATCH

SPECIAL
FOOD
ENGINEERING
SERVICE to
EXECUTIVES

Minute Maid has made available two methods of processing concentrate from freeze-damaged citrus fruit. One involves screening juice to remove quality-deteriorating pulp particles. The other utilizes inert gas to prevent oxidation of concentrate after it is frozen.

Serious enemy of Great Lakes fisheries—the sea lamprey—may have met its match. In tests, 92% kill was obtained in 2 days when 30 ppm. of the chemical "Dowlap" was fed into a stream.

New kind of corn with high amylose content is under study at USDA lab. An unusual type of starch, amylose will make edible films of potential use as coverings for foods.

Tenderizers promise to affect economics in the meat business by upgrading the quality of steak. Armour is tenderizing low-priced steaks for restaurants by 1 min. dip in enzyme solution. Freezing stops action.

Will milk from pollen-inoculated cows relieve hay-fever sufferers? That, the Chicago Board of Health now is researching. If it works, the anti-sneeze milk will be under prescription sale.

Fresh quality of sweet cherries can be preserved longer by packing the fruit in lugs lined with polyethylene film, USDA reports. Carbon dioxide build-up within liner does the trick, permitting slower, cheaper freight transportation.

A "basic" breakfast containing one-fourth the daily caloric and protein requirements is better than a heavy meal as far as mental and physical efficiencies are concerned, University of Iowa research indicates. Cereal and milk—or egg, bacon, and milk—qualify.

California strawberry growers and freezers will be able to supply a new variety of berry competitive with Pacific Northwest varieties in taste, color, and size. University of California has perfected the new berry.

Control of apple scab reportedly is achieved with a new fungicide developed by Imperial Chemical Industries, England. It can be used as protective spray or to eradicate a scab infection.

New technique for measuring thickness of film or foil traveling at speeds to 100 fps. has been developed by Sheffield Corp., Dayton. The film is penetrated 600 times a second by low-intensity X-ray pulses. Could be useful in food field.

Washington
Report
p. 25

One of the country's biggest food research centers will be built on a 13-acre tract in Glenview, Ill., by National Dairy Products Corp. Cost will range between $3 and $5 million.

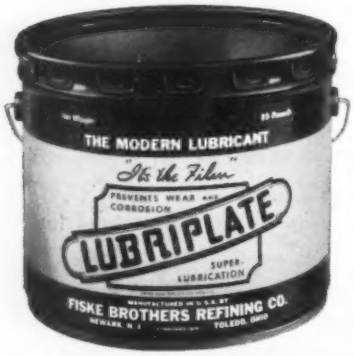
Complete meals will be vended hot on plates in a robot restaurant by 1960. That is the prediction of American Canteen Co. Frozen foods will be converted to hot items in 20 sec.

SEE NEXT PAGE →

Lubriplate No. 630-2 is a high temperature, extreme pressure, water-repellent, grease type lubricant. Ideal for the general lubrication of Industrial, Automotive, Construction, Farm and Marine Equipment. Lubriplate Grease Gun Cartridges provide an easy, quick, economical means of application. Prevent the waste and mess of hand filling. Packed 10 Cartridges in a handy carrying carton.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.



Developments to Watch

Pet Milk Co.'s new instant process expands dry milk crystals by "popping," and they dissolve on contact with water. Instant dry milk is one of fastest growing items in grocery business.

One frozen food packer is developing new institutional package that can be heated in electronic oven for fast, labor-saving serving.

Molded plastic may become cheaper than paperboard for half-gallon ice cream containers. Progress is rapid in forming of plastic packages.

Report New Safer Insecticides

Lower-toxicity insecticides are on the way. USDA chemists at Beltsville, Md., have come up with special compounds that test ⅛ less toxic to warm-blooded animals than pyrethrum and ¼ less toxic than allethrin—the "old reliables." Employed are new derivatives of chrysanthemumic acid.

Efficient and economical methods for making the new compounds still have to be worked out.

Hits Fad Diets, Price Gripes

Homer Davison

"In recent years, we've witnessed a rising consumer indifference to the need for an adequate, balanced diet," declares AMI President Homer Davison on the eve of the National Food Conference, of which he is planning committee chairman.

The Conference opens in Washington, D. C., on Feb. 24.

"Food fads, self-prescribed diets, and the American tendency to hurry and rush have in many instances," says Mr. Davison, "made food seem non-essential and resulted in meals lacking the nutrients for good health."

At the same time, he pointed out, food has become a whipping boy for the uninformed, who berate the industry for product costs. Grocery prices have actually fallen—declining 2% since '52, while overall living costs rose 6%.

BRIEFLY

• THE MEATIER HOGS of Canada are now under the eye of seven USDA specialists, object being improvements in our producing and marketing methods. Factor here is American consumer's swing toward less fat in pork.

• SAUSAGE STUFFING with pumps (such as Moynos) is being explored by meat packers. Aim is continuous operation abolishing periodic reloading of stuffing unit.

• A GRAIN CONVEYOR hailed as world's longest has gone into operation at A. E. Staley Mfg. Co., Decatur, Ill. Half-mile-plus belt can move 8,000 bu./hr. of corn.

Big Food Conference Opening

Key leaders in farming, processing, distribution, and merchandising will join together in a mammoth Na-

(*Turn to page 21*)

Film Tent 'Sleeps' Fruit Longer

Running of regular refrigeration coils inside is new 'wrinkle' in Mylar enclosure for controlled-atmosphere fruit storage. And fan system circulates air for removal of CO_2, with oxygen level kept low to 'sleep' fruit extra months. Designed by Fruit Industries Research Foundation, Yakima, Wash., 103x14-ft. 3-mil-film tent is set up for apples at Stubbs-Lamb Fruit Co. (See also FE, Nov., p. 121.)

Yes! . . . it's ALL STEEL

HP RANGE:
½ to 50 hp

RATIOS:
4:1—14:1—24:1 (or 20:1)

OUTPUT SPEED RANGE:
420 to 5 rpm

TORQUE RATINGS:
up to 31,500 lb-in

FALK
ALL STEEL
Shaft Mounted Drive

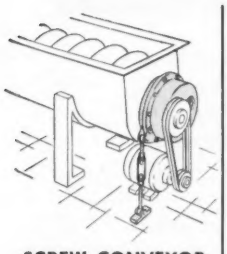
. . . Steel can "take it"!

STEEL frame . . . of fabricated plate supports all rotating elements—provides double the ability of iron to maintain vital alignment of revolving elements, even under shock load or external impact.

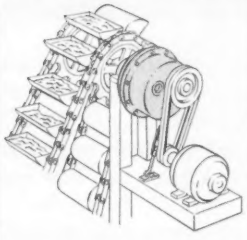
STEEL housing . . . will not fracture, serves only as protective cover and lubricant reservoir. Therefore, lubricant supply is safeguarded.

STEEL tie-rod and straddle-mounted tie rod brackets . . . are fastened to heavy steel frame by steel bolts in double shear.

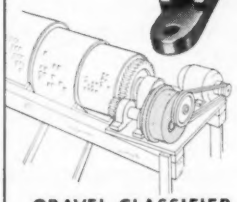
A FEW TYPICAL APPLICATIONS



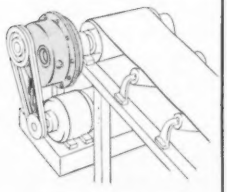
SCREW CONVEYOR



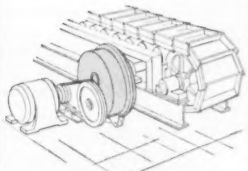
BUCKET ELEVATOR



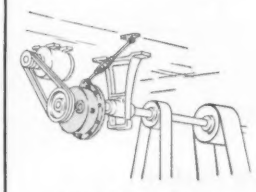
GRAVEL CLASSIFIER



BELT CONVEYOR



APRON FEEDER



LINE SHAFTING

DELIVERIES TO MEET YOUR REQUIREMENTS

Off-the-shelf delivery **from your Authorized Falk Distributor.** ***Shipment from factory or warehouse stocks*** **within 72 hours after receipt of your order.**

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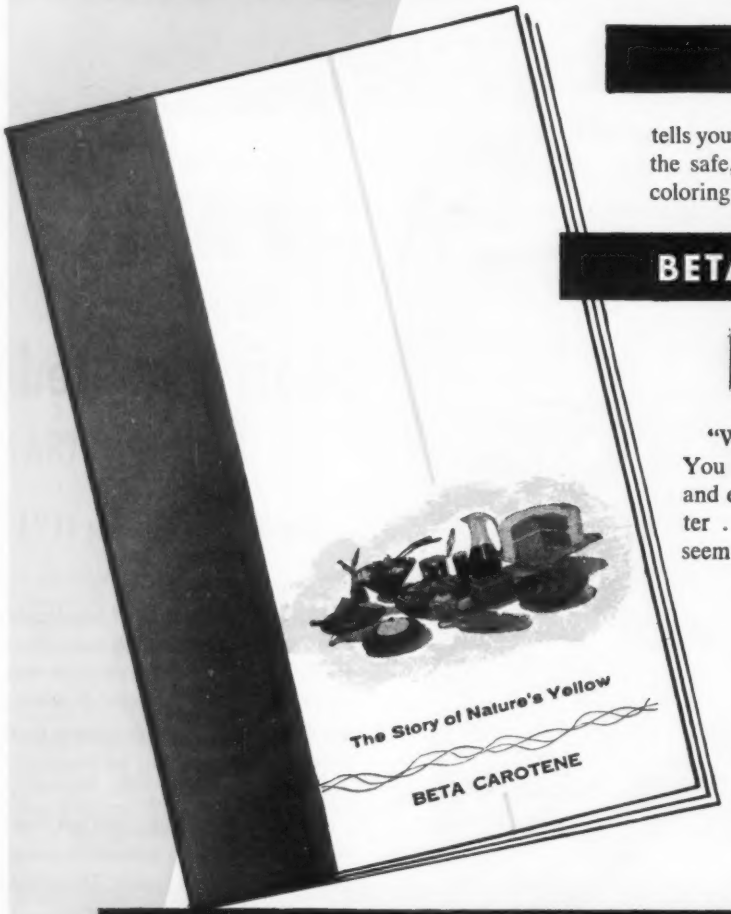
Representatives and Distributors in Most Principal Cities
Manufacturers of Quality Gear Drives and Flexible Shaft Couplings

FALK
. . . a good name in industry

An Announcement of Major Importance In Food Coloring



NEW BOOK

tells you for the first time all about the safe, sure, yellow, pure food coloring with vitamin A value —

BETA CAROTENE

From beginning . . .

"Why Is Color So Important? You pick the big, colorful apple and every bite seems to taste better . . . The *best-looking* foods seem to be the *best-tasting.*"

To end . . .

"Color calls to your appetite — and beta carotene makes a compelling call to good things, good foods, good nutrition, and good living."

Get your copy of this Unique, New 20-page, 4-color book

FREE

This is a technically accurate, interesting, and informing book. It tells you why carotene is no stranger to us . . . the story of the carotenoid family and carotene's history . . . all about beta carotene's safety . . . how to use it most profitably in processing foods . . . why it has important vitamin A value . . . how man matches Nature to make carotene.

If you're concerned with the processing, preparation, marketing, advertising, or constant improvement of food, send today for your own copy. There's no charge, of course.

To: Vitamin Division
Dept. FE-2
Hoffmann-La Roche Inc.
Nutley 10, New Jersey

Please send me a copy of
"The Story of Nature's Yellow — Beta Carotene."

*Name*_____

*Address*_____

*City & Zone*_____ *State*_____

Send this coupon

for YOUR FREE COPY

of the new Carotene brochure

tional Food Conference, Feb. 24, 1958, in Washington, D. C.

Object of the gathering—sponsored by eighteen farm and food commodity groups—is to "re-awaken the public to the fact that better food means better living, set forth the urgent need for correcting the inadequacy of many family meals, and examine the vitality of the American food industry".

New Set-Back in Fly Battle

Once again flies have rallied against the sanitarians.

Earlier, DDT-type sprays had effectively controlled them. But then resistant flies appeared and soon multiplied.

During the past 5 yr., this tougher breed has been pushed back by organophosphorus compounds (malathion, Dipterex, Diazinon, parathion).

But recent tests in Florida show strains of the pests are now resisting these agents, too. So again new formulas are sought.

Schedule of Events

February

14-16—Institute of American Poultry Industries, fact-finding conference; Municipal Auditorium, Kansas City, Mo.

16-28—American Institute of Baking, production management seminar; 400 E. Ontario St., Chicago.

24—National Food Conference, sponsored by nation's major food groups; Hotel Statler, Wash., D. C.

March

2- 6—National Assn. of Frozen Food Packers, annual convention & exposition; Conrad Hilton Hotel, Chicago.

3- 6—American Society of Bakery Engineers, annual meeting; Edgewater Beach Hotel, Chicago.

6- 8—Refrigeration Research Foundation, annual meeting; Adolphus Hotel, Dallas.

8-12—National-American Wholesale Grocers Assn., annual meeting; Palmer House, Chicago.

9-14—National Assn. of Refrigerated Warehouses, annual meeting; Hotel Statler, Dallas.

10-13—American Warehousemen's Assn., annual convention; Hotel Adolphus, Dallas.

15-18—National Peanut Council, annual convention; Shoreham Hotel, Wash., D. C.

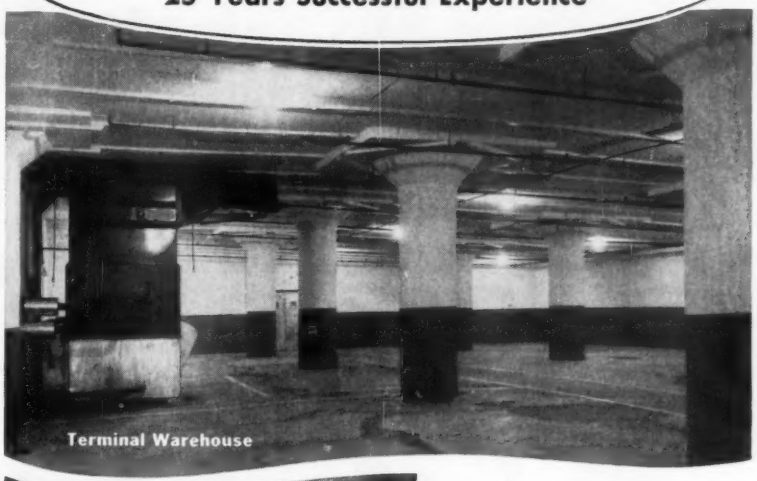
17-21—International Atomic Exposition, International Amphitheatre, Chicago.

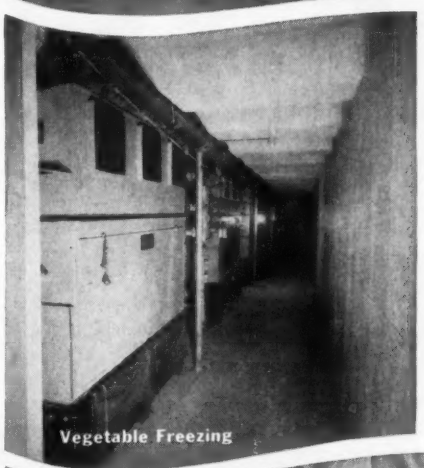
19-20—American Dairy Assn., annual meeting; Congress Hotel, Chicago.

25-28—Packaging Machinery Mfrs. Institute, annual exposition; Convention Hall, Atlantic City.

NIAGARA "NO FROST"

25 Years' Successful Experience





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Write for Niagara Bulletin 105

NIAGARA BLOWER COMPANY

Dept. FI-2 , 405 Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities of U. S. and Canada

For more data, circle this page number on card at back →

New HEAVY-DUTY INTERNATIONAL V-8's

TRUE TRUCK TORQUE
TRUE TRUCK ECONOMY

Greater Gasoline Economy

All-Truck INTERNATIONAL heavy-duty V-8 engines with *True Truck Torque* combine short stroke with low engine rpm. The result: less engine friction and drag. More working power is released *from* the engine, less gasoline is required to maintain it.

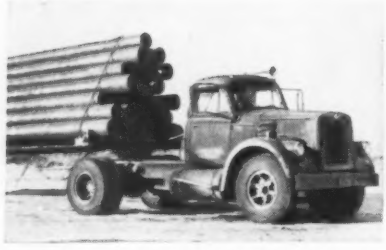
More Usable Power at the Wheels

Efficient engine power doesn't pay off until it reaches the wheels. Heavy-duty INTERNATIONAL V-8 Truck transmissions and axle ratios convert low engine rpm into extra-payload hauling power at the wheels where it counts. That's *True Truck Torque!* There's more "go" with more economy because engine, transmission and axle are balanced to match truck, traffic, terrain and job *exactly!*

Longer Engine Life

INTERNATIONAL heavy-duty V-8's combine rugged, all-truck design with big 401, 461 or 549 cubic inch displacements to develop full horsepower without life-shortening stress or strain. Exclusive "wet" replaceable valve guides, fully machined combustion chambers and other endurance features cut your maintenance costs.

Whatever your hauling problem, there's a heavy-duty INTERNATIONAL Truck with True Truck Torque V-8 engine to handle it. Proof? See the statements of INTERNATIONAL heavy-duty V-8 truck owners who do the same truck job you do . . . at your INTERNATIONAL Dealer!



INTERNATIONAL model V-225 tractor with 549 cu. in. V-8 engine

INTERNATIONAL model VF-192A dump with 401 cu. in. V-8 engine

International Harvester Company, Chicago
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

INTERNATIONAL TRUCKS cost least to own!

Whether you are refining sugar or buying it for use in your process operations, you can be sure that liquid sugar is free of thermophilic bacteria when it is filtered with Celite*. Efficient, economical Celite filtration delivers brilliantly clear liquid sugar that will remain positively pure as long as it is protected from recontamination by spores in the surrounding air.

Celite is also ideal for filtering other food products such as syrups, jellies, beer and wine. Composed of microscopic particles of pure inert diatomaceous silica, Celite provides fast, economical clarification . . . never affects the most delicate flavors.

And with Celite you get important advantages over other diatomites. Its lower wet density means greater filter surface coverage. Its high uniformity means more consistent results. For more information on how Celite filtration helps the food industry make better products at lower cost, call your near-by Celite engineer or write Johns-Manville, Box 14, New York 16, N.Y. In Canada, Port Credit, Ontario.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

Johns-Manville CELITE
diatomite filter aids

JOHNS-MANVILLE JM PRODUCTS

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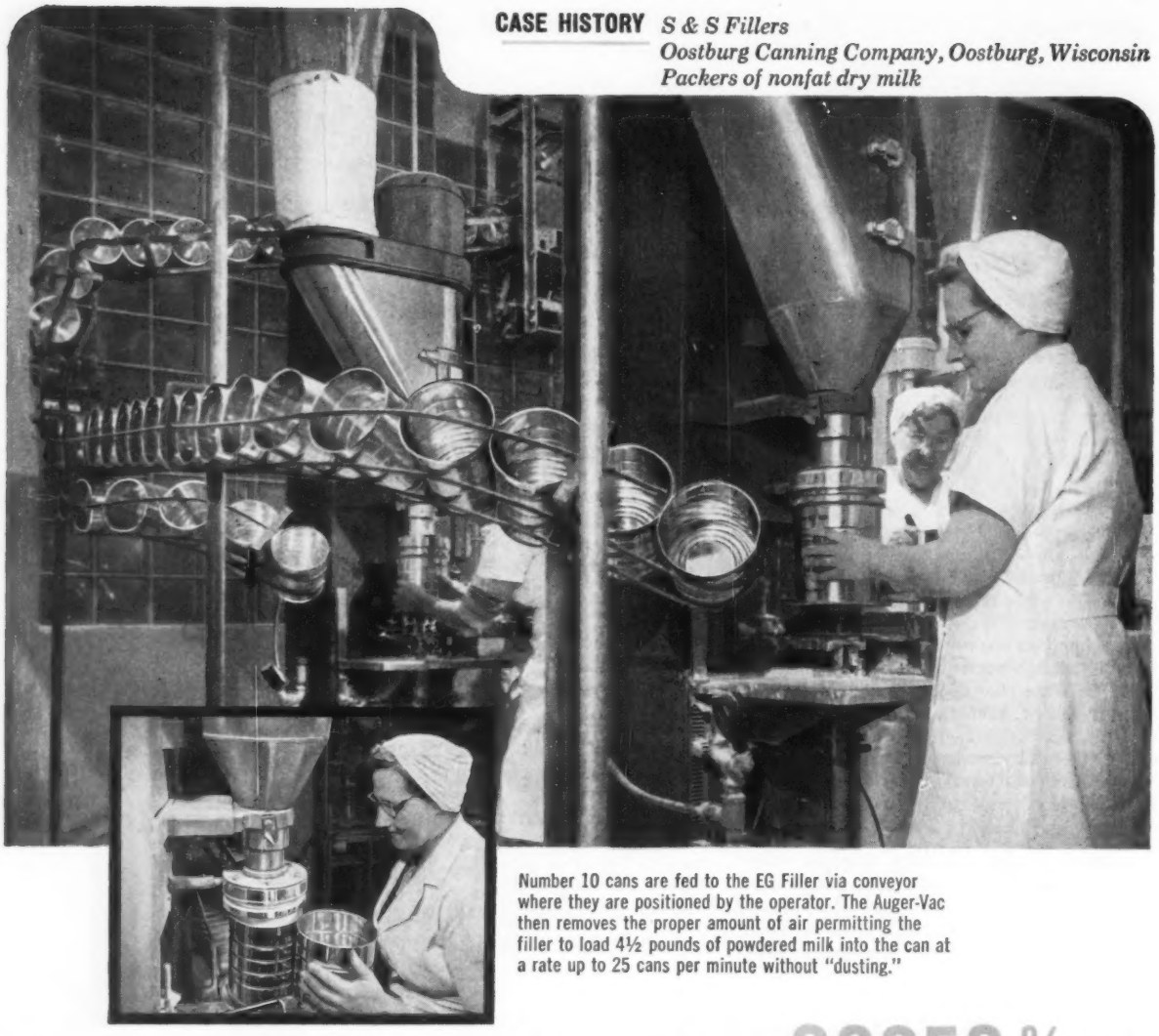
CASE HISTORY *S & S Fillers*
Oostburg Canning Company, Oostburg, Wisconsin
Packers of nonfat dry milk



Number 10 cans are fed to the EG Filler via conveyor where they are positioned by the operator. The Auger-Vac then removes the proper amount of air permitting the filler to load 4½ pounds of powdered milk into the can at a rate up to 25 cans per minute without "dusting."

Powdered milk filling loss less than .00058%

"Of the more than 200,000 pounds of powdered milk we handle each day, we lose only 110 to 115 pounds—or .00058%—due to dusting at the loading hoppers and filling stations. This amount would be much larger if we did not have Stokes & Smith Fillers with Auger-Vac attachment," reports Mr. Ellsworth Van Driest, secretary-treasurer of the Oostburg Canning Company.

"Before buying our fillers, we inspected other powdered milk operations to determine which machines were most efficient. We found that Stokes & Smith equipment led the field by a wide margin. In addition to three S & S G1 Fillers, we also purchased two S & S EG Fillers to permit quick easy conversion from packaging in 4½ pound, No. 10 cans to bagging cartons when the latter package is required.

"We have found our fillers to be dependable, rugged, well-designed and versatile. After two years of constant use, they are never down longer than one hour at a time. This ease of servicing plus versatility helps us maintain our 'full status' with U. S. Dept. of Agriculture packaging requirements."

For complete information on the versatile EG Filler, write to:

FMC PACKAGING MACHINERY DIVISION

fmc
FOOD MACHINERY AND CHEMICAL CORPORATION

Stokes and Smith Company

4914-F SUMMERDALE AVE.
PHILADELPHIA 24, PA.

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Range Anti-Trust Guns on Food Firms

The Federal-'58 winds will be sending more and more anti-trust whirls around the feet of food processors, packagers, and marketers.

New Attorney General William Rogers has his trust-busters focusing on "cost-of-living" industries, seeking to cut down "illegal trade restraints that work to force living costs upward." So Government lawyers look for targets in the consumer's price index.

Prime aim is at market areas showing serious inflationary pressures. For example, while overall retail food prices rose but 7% in the last two years, those for meat, poultry, and fish ran higher. Accordingly, there's sleuthing for restrictive trade practices.

Grand jury investigations already are in progress in other areas—such as possible collusive pricing of milk in Nebraska and Iowa.

Pending cases challenge mergers or acquisitions by dairy and frozen food companies, also container and packaging-film makers. Eagle-eyed are corporate acquisitions that diversify or enlarge a company's operations, on grounds they tend to lessen competition or create monopolies.

FTC started off '58 by charging that Consolidated Foods, Inc., violated the anti-merger law in '51 by acquiring Gentry, Inc. Thus, argues FTC, Consolidated can use its purchasing power to coerce suppliers to buy its dried seasonings (Gentry made) through threat to withdraw its patronage.

Some of the cases may be decided this year, thus setting up yardsticks for measuring future corporate-expansions-through-merger and vitally affecting the specific industry segments involved.

Further anti-merger cases may be expected, along with continued moves against alleged discriminatory discounts and promotional allowances granted, on purchases, to large retailers (mostly chains) and food manufacturers and processors.

Pegs FDA Budget at $9.3 Million

Figure for FDA, in the Administration's budget, is $9.3 million—the same as it was for the current year—plus an extra $110,000 for study of nuclear radiation effects on foods.

FDA originally had sought $11 million for the upcoming year, in line with the recommendations of a citizens advisory committee for a long-term buildup of the agency. But this $1.7 million up has been lost in the present accent on the military.

Focus on Legislation

Keep an eye on developments relative to the following bills during the 85th Congress second session:

FDA food additives bills (H.R. 8390 and H.R. 8629): Continuation of hearings is imminent (See FE Dec. '57, p. 51).

Meat packer bills (S. 1356 and H.R. 5282): These aim to bring packers back in range of FTC's anti-trust enforcements. USDA now has the jurisdiction.

Price discrimination bills (S. 11 and H.R. 11): Related to Robinson-Patman Act, these seek to restrict use of the "good faith" defense where actions in question have tended to limit competition or promote monopoly.

Waste disposal bills: Legislation to modify the Internal Revenue Code in order to provide rapid amortization of waste treatment and disposal facilities.

Cooperative tax bills (H.R. 4265 and H.R. 501): These target certain tax exemptions enjoyed by co-ops.

Ike Asks Boost in Crop-Use Research

A 15% up in the agricultural research budget is asked by the President—with fresh emphasis on finding new industrial uses for farm crops. This boost would be spread over three of four categories. Here's the picture—

	Millions of Dollars	
	Current Year	Next Year
Production research	104.7	120.2
Marketing research	29.7	35.2
State experiment stations	30.4	30.4
Industrial utilization research	14.0	19.0

If enough funds are forthcoming, prospects should be good for developing new market outlets. In addition to the $19 million sought for utilization work, the Administration hopes to apply some $5 million more in counterpart funds to similar projects abroad.

BRIEFS

Overall, Agriculture is listed for less in Ike's budget proposals. Total called for is $4.6 billion, down some $300 million. And the price-supporting CCC would be taking a $400 million cut. So farm-state congressmen loudly cry that it's "all at the expense of the farmers"—heralding a hot fight, since Secretary Benson can't lower price supports without a Congress O.K.

Cuban-sugar import restrictions stay "as is"—much to the displeasure of industrial sugar users. They'd appealed for more of the lower-cost product by way of extra-quota imports. But USDA is holding these shipments to the mere 25.59% ruled in '56, claiming more would harm the interests of domestic producers.

Now banned by FDA is use on dairy cows of a fly spray containing 0.25 ppm. of methoxychlor pesticide. Cited by the Agency are new tests indicating slight toxic residues in milk after such spraying. Dusting practice, however, has not been implicated.

A very practical volume on insect adulteration is now being readied by FDA's Bureau of Biological & Physical Sciences. It will be a comprehensive, profusely illustrated work on insects and insect fragments that cause food contamination, covering identification, life cycles, routes of adulteration, and the other key factors. Title: *Identification of Insect Contamination of Foods by the Micromorphology of Insect Fragments.*

SANDVIK "Tru-Track"*
STEEL BELT CONVEYOR GIVES
"...Faultless Operation"
ON THIS PACKING LINE

"...so easily cleaned --"

"...runs perfectly straight --"

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November 6, 1957

Olaf Hellsund
Sandvik Steel, Inc.
3338 South Malt
Los Angeles 22, Calif.

Dear Mr. Hellsund:

It has been one year since we purchased our two Tru-Track stainless steel conveyors from you. During this time they have been in constant use in our new Delicatessen Kitchen, giving us absolutely faultless operation.

Our Manager, Bill Madison, says they are the best equipment in the plant owing to the fact that they are so easily cleaned and the belt runs perfectly straight at all times regardless of the weight it carries.

We have taken numerous operators through our kitchen and the conveyors surely got more than their share of attention from these visitors.

Last but not least, Mr. Hellsund, we were very pleased with your almost daily visits to our plant at which time you acquainted our plant personnel with your equipment during our first month of operation.

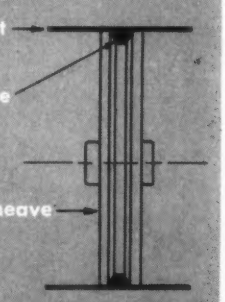
Yours very truly,

VON'S GROCERY COMPANY

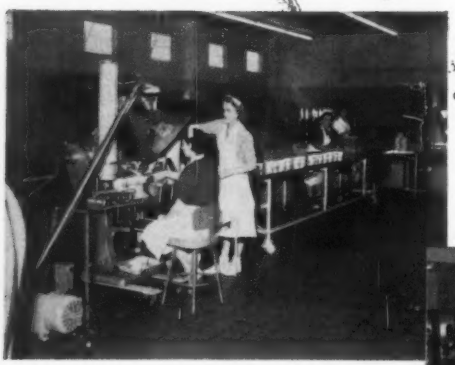
Edw. F. Hirschman.

EDW. F. HIRSCHMAN,
DELICATESSEN DIVISION MANAGER

Schematic drawing of "Tru-Track" Design principle



*Pat. Applied For



Portable Sandvik "Tru-Track" conveyor carries packages of VON'S enchilada and salads from filling machine to packer on a stainless steel belt.

Another view of the SANDVIK Conveyor at Von's Grocery Co., Los Angeles, Cal. Stainless *Tru-Track* belt is 10" wide; carries product 20 feet. Entire unit mounted on casters for mobility.

35-611

SANDVIK STEEL BELT CONVEYORS

SANDVIK STEEL, INC.

Steel Belt Conveyor Department

1702 Nevins Road, Fair Lawn, New Jersey

In Canada: P. O. Drawer 1330, Station "O", Montreal 9, P. Q.

Branch Offices: Cleveland • Chicago
Los Angeles

Manufacturers Of Conveyors and Bake Oven Bands For Over 40 Years

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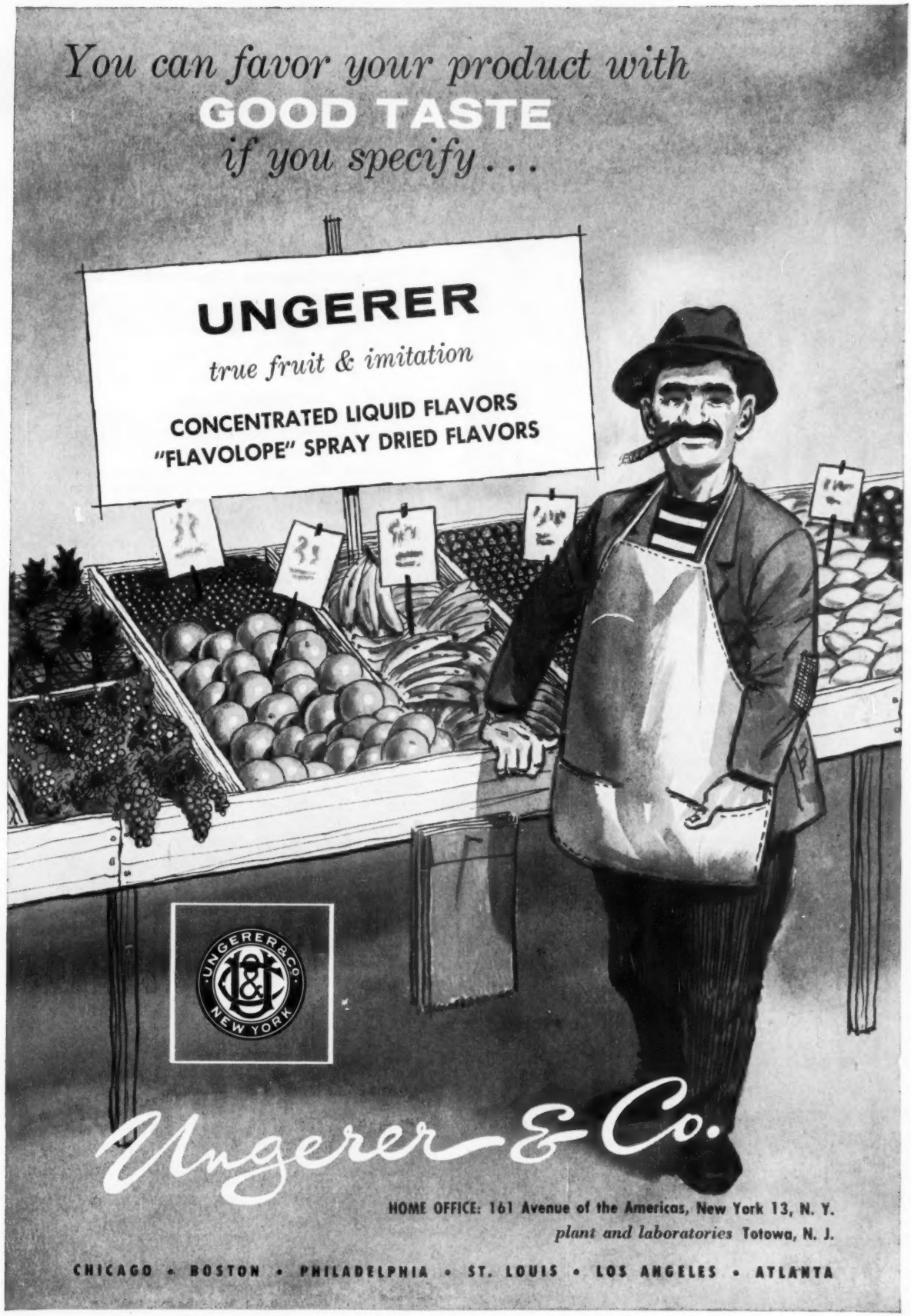
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NEW PACKAGES & PRODUCTS

◂"Twinpack" boosts Regional Milk Sales

Southern and Eastern dairies are reporting substantial sales increases with use of a multiple carrier for quart milk cartons.

Manufactured by Packaging Planners, the carrier is a folded, stiff paper self-locker that grips the top flange of the conventional cartons.

An 8% increase in sales has been reported by William Colteryahn and Sons dairy of Pittsburgh since its adoption of the "twinpack" last March. The carrier offers a saving ($\frac{1}{10}$¢) in material costs over the half gallon package previously used by the dairy.

Others using the self-locker include dairies in New York, Georgia, Florida, Tennessee, and Maine.

The package is reported to require no additional equipment, and is available in individual dairy labels or in stock design. The cartons used are supplied by American Can Co.

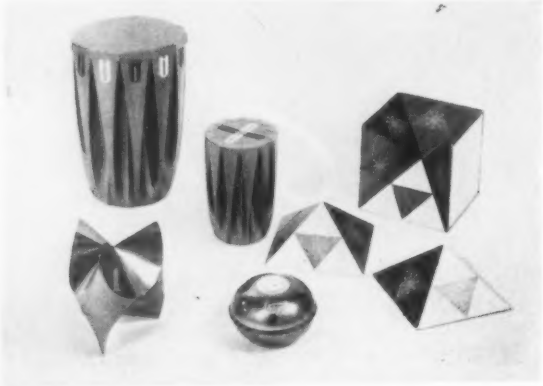
Circle 28A on Reader Service Card

Olive Oil Makes Its Debut in Cans ▸

Heralding its new package as the first change in olive oil packaging for years is Castello Packing Co., whose product is now marketed in a 32-oz. metal can.

Originally designed by Continental Can Co. for detergents and other corrosives, the can's construction makes it a "natural" for olive oil. The threaded, dripless polyethylene nozzle provides a tight reclosure. Cemented side seam allows wrap-around lithographed labeling.

Circle 28B on Reader Service Card



◂Package Designer Looks to the Future

Created for Aluminum Company of America by Harley Earl Associates are these unique and intriguing "food packages of the future". Made of sparkling aluminum foil, the packages are said to herald the time when housewives will buy products because of beauty and usefulness of container.

The drum-shaped containers are for dry products which may be dispensed through a shaker top. Tripod packages hold milk, cream, or other liquid foods. Frozen foods, ice creams are packed in the triangular containers which may be nested together to form a cube. Sphere is an aerosol container.

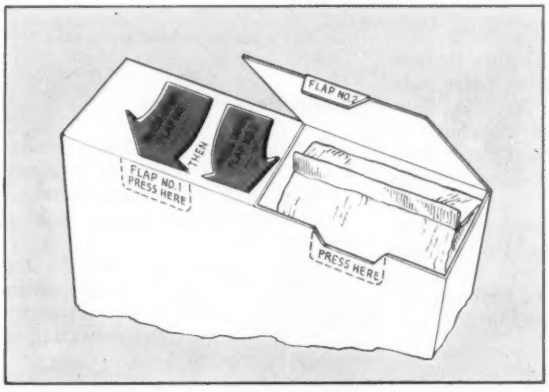
Circle 28C on Reader Service Card

New Anti-Leak Lid for Food Cartons ▶

Designed to prevent leakage and withstand rough handling is a new clear plastic closure developed by American Can Co.'s Dixie Cup division. The lid resembles the supplier's standard plastic closure except for a heavy styrene ring fitting snugly inside the skirt.

The ring makes it virtually impossible to remove the closure without breaking the ring. Closures shipped from the factory already have the ring in place. The ring lid is available only to special print food packagers. Lid itself is of oriented styrene.

Circle 29A on Reader Service Card



◀2-Section Carton Packages New Mix

The tenth in the Swans Down cake mix line, Lemon Chip Angel Food Cake, is packaged in an unusual 2-compartment carton. One section holds the egg white mix, the other holds the flour mix.

Prominent arrows on the carton side call the consumer's attention to the flap openers.

Chips of real lemon are added to the mix with natural lemon flavor to give the baked product a true fruit flavor.

Market Muffin Mix in Four Flavors ▶

General Mills has introduced a line of Betty Crocker Muffin Mixes in four flavors: corn, date, orange, and raisin-bran.

Each 14-oz. box contains two separate, sealed laminated packets to insure freshness and for recipe convenience. Each 7-oz. packet makes 6-8 muffins. Fresh eggs and water are added to prepare.

Marked with the familiar red spoon trademark, the packages are all similar in design to emphasize "family".

◀Adds Family Portion of Chow Mein

Aimed at the average American family of "3.6 people" is a big 2 lb. package of frozen chow mein marketed by Temple Frosted Foods. Packed in deep aluminum trays, each unit yields full portions for four people.

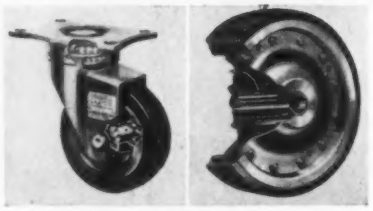
Three styles of chow mein are packed: chicken, shrimp, and vegetable.

The food must be thawed before heating. Noodles and rice may be added as preferred.

write for

your copy

DARNELL
CASTERS AND WHEELS



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— the most for your money —

RUBBER TREADS . . . a wide choice of treads suited to all types of floors, including Darnelloprene oil, water and chemical-resistant treads,

RUST-PROOFED . . . by zinc plating, Darnell Casters give longer, care-free life

LUBRICATION . . . all swivel and wheel bearings are factory packed with a high quality grease that "stands up" under attack by heat and water.

STRING GUARDS . . . Even though string and ravelings may wind around the hub, these string guards insure easy rolling at all times.

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Packages & Products

Cakes Baked-in-the-Can

Priced competitively with conventionally packaged bakery items is a vacuum baked canned cake marketed by John G. Paton Co., New York. Packed under the Slice 'n Serve label the cake is made in chocolate fudge, marble, and golden pound flavors.

The 12-oz. cakes are produced by the Vacuum Baking Corp. Each will serve eight people.

Market tests will be conducted in New York and Philadelphia.

Cuts Preparation Time

Minute Rice, General Foods' nationally distributed pre-cooked rice product, has broken its own speed record for fast preparation.

It now takes only five minutes from package to plate instead of the former ten.

Packaging Briefs

Laminated Mylar-foil-polyethylene pouch is used by Gerage Catering Co., Chicago for its frozen roasted beef. Product is cooked simply by placing the package in boiling water for 30 min. Supplier is Continental Can Co.'s Shellmar-Betner Flexible Packaging Div.

Extra-large 16-oz. carton is used for most popular Gerber baby cereals: oatmeal and mixed cereal. Packages will correspond in color and design to the standard size and will have a built-in pouring spout.

"Square-Shoulder" look is a feature of the new General Foods' Postum jars. Jars of all sizes now have a new high shoulder permitting more label space. Label has been redesigned for greater readability and quick shelf identification.

"Boilable" Plastic Film

Designed primarily for foods which will be cooked in the package is a new low-cost, heat sealable polyester film made by Minnesota Mining & Mfg. Co. The 2-mil thick film, a member of the Scotchpak brand sealable polyester film has a pronounced ability to maintain its seal strength in boiling water.

Identified as food film No. 20A5, it is sealable on one side. Tensile strength is rated at 7,800 lb per sq in., and burst strength (Mullen) is 40 lb per sq in.

The film is impervious to oil, most acids and bases and most solvents or volatile elements.

Circle 30A on Reader Service Card

Tests Pop Powder

National Biscuit Company has completed test marketing of a carbonated soft drink powder in selected metropolitan markets in Florida and Ohio.

Sold temporarily under the Uneeda label, the beverage powder is made in several flavors. Processor plans to continue test marketing in the Spring of 1958.

Expands "Instant" Line

Two hydrolized protein drinks are marketed by the Nestle Co. as companion products to the processor's instant tea (Nestea) and instant coffee (Nescafe).

Beef and chicken flavored drinks are made by adding hot water to the crushed buillon cubes. Package is a 2.32 oz. glass jar.

Introduce Metallized Paper

Designed for can and bottle labels, or for use in carton overwraps and tight wraps for set-up boxes is a new metallized paper developed by Continental Can Co.'s Shellmar-Betner Flexible Packaging Division.

Nabisco has a reason...

Crispness plays a big part in the delightful sensation of flavor in foods like Nabisco Wheat Honeys. But the high affinity for moisture of the honey coating creates special problems. That's why Nabisco reached for a special Riegel waxed glassine-foil laminate as sure-fire protection against moisture penetration. It's evidence, too, that *protected by Riegel* means *extra* benefits:

Product protection always, plus flexible packaging materials that are
- ... tailored to run at high speed on automatic machines
- ... made to your own specifications, printed, waxed, coated, and laminated combinations of all types
- ... packaging materials that are made right, run right, and priced right

Hundreds of today's best-sellers benefit from Riegel's uniformly effective system of product protection. You can, too.

Write Riegel Paper Corporation, 260 Madison Avenue, New York 16

Riegel

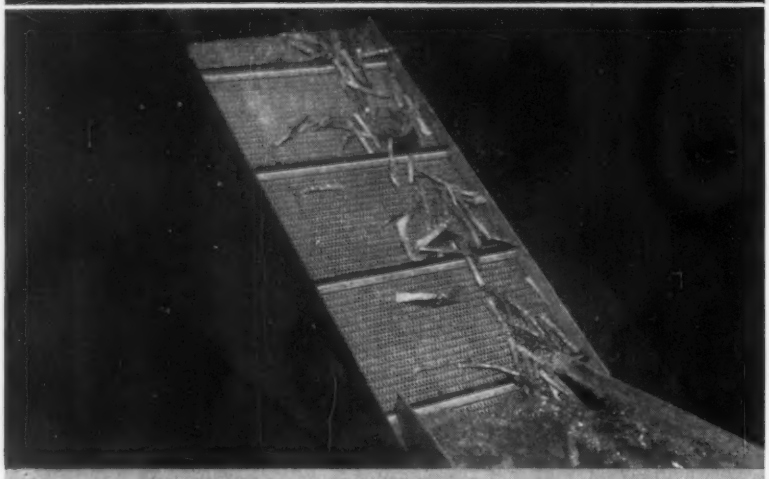
PROTECTIVE PACKAGING MATERIALS

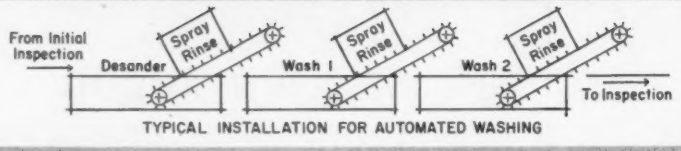
National Biscuit Company uses Riegel's special development of waxed glassine-foil lamination as a moisture barrier for Wheat Honeys, packaged at high speed on Pneumatic Scale Corp. equipment.

P. S.: IMPORTANT PACKAGING NEWS!
Riegel's new Indiana Plant is specializing in the production of PRINTED POLYETHYLENE FILM and Polyethylene extrusions on cellophane and Mylar®.
Your inquiries are invited.

For more data, circle this page number on card at back →

Cambridge WIRE MESH BELTS





TYPICAL INSTALLATION FOR AUTOMATED WASHING

METAL-MESH BELTS PROTECT FLAVOR, QUALITY IN CONTINUOUS PROCESSING

Continuous washing, blanching, freezing and packaging on Cambridge Wire Mesh Belts give you more uniform, high quality products, help protect food flavor and taste appeal. All-metal belts can't rust, rot, or absorb odors; can't contaminate foods. Wire mesh is cleaned quickly and thoroughly with steam or spray rinse. In baking, cooking, cooling and inspection operations, too, Cambridge Belts help increase production and reduce manual handling. Here's how:

CONTINUOUSLY MOVING BELTS ELIMINATE BATCH PROCESSING—help maintain capacity production and lower operating costs.

OPEN MESH PERMITS FREE CIRCULATION—air or process solutions pass freely through the belt for uniform processing or flash drainage of solution.

ENDLESS MESH BELT GIVES LONGER SERVICE—has no seams, lacers or fasteners to break; takes up to 2100° F. or sub-zero temperatures.

SPECIAL SURFACE ATTACHMENTS AVAILABLE—raised edges or cross flights to hold product on belt during movement.

Talk to your Cambridge FIELD ENGINEER soon—he'll explain the many advantages of continuous food processing on Cambridge Wire Mesh Belts. He'll recommend the belt size, mesh or weave—and the metal or alloy—best suited to your operations. You'll find his name in the classified phone book. Or, write for FREE 130-PAGE REFERENCE MANUAL giving mesh specifications, design information and metallurgical data.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

Department Q, Cambridge 2, Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

Packages & Products

Not yet in commercial use, the paper is being tested by packers.

Almost identical to aluminum foil laminations in appearance, the paper is less expensive. Readily adaptable to standard labeling machines, the metallized paper may be an answer to the problem of label curling.

It lends itself well to printing.

Circle 308 on Reader Service Card

5 New Convenience Foods

Following successful test-marketing in 15 metropolitan areas, a new line of ready-to-eat main dishes is being distributed by H. J. Heinz Co.

Packed in 15¼ oz. cans, the items typify the continuing trend to convenience foods in today's market. The "Minute Meals" were originally developed for use in individual portion containers in restaurants.

Varieties include beef stew, chicken stew, beef goulash, chicken noodles dinner, and chop suey.

New Product Shorts

Champagne Stock wine vinegar is latest addition to Ellena Bros. Regina food line.

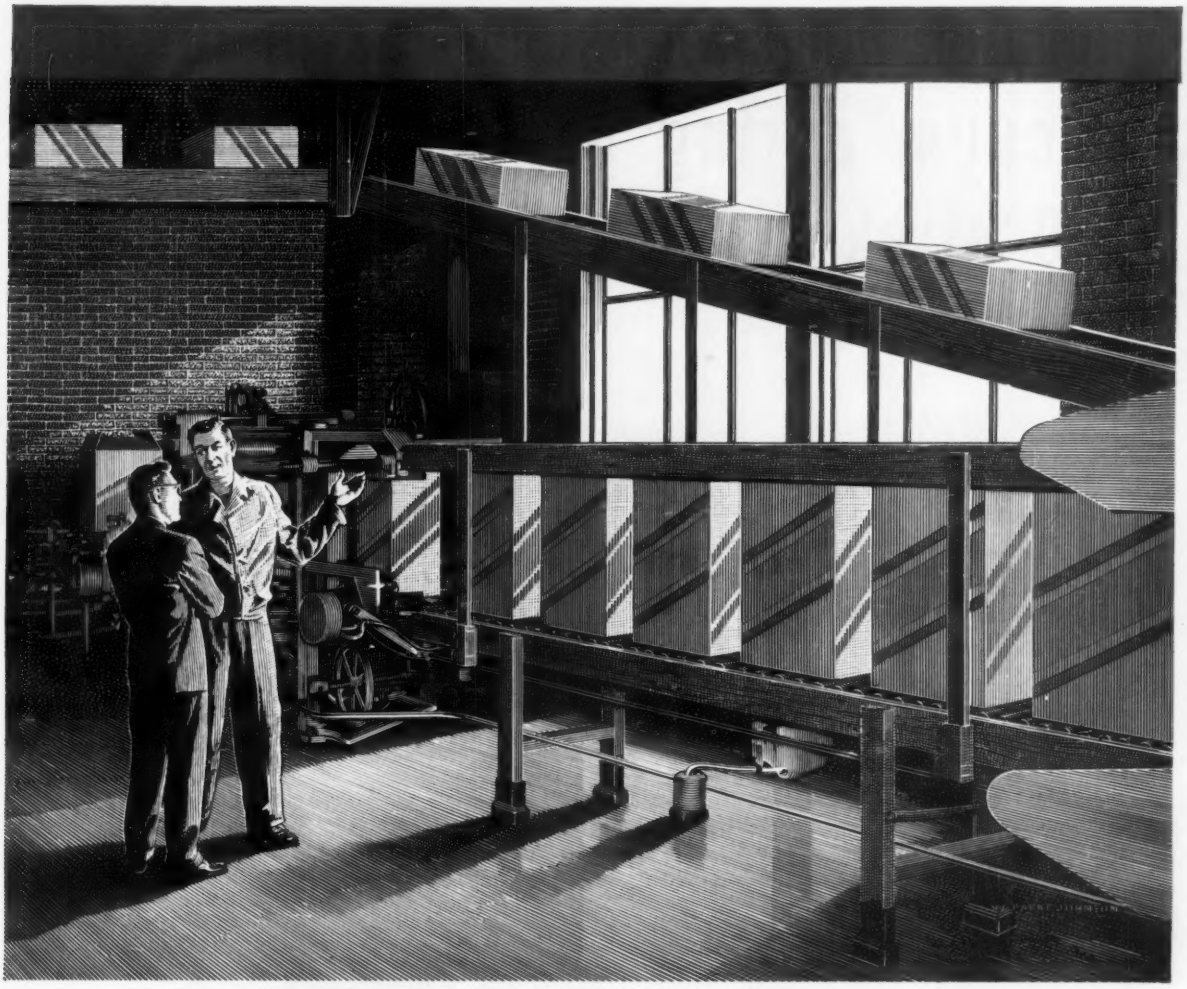
Instant Malted Milk is made in chocolate and natural by Horlick's Corp., Racine, Wis.

Six Relish Products and a home-style dressing have been added to the complete line of olive and olive products packed by the House of Guest, Inc.

New Food for baby is Gerber Baby Foods' strained macaroni, tomato, beef and bacon. Package is 4½ oz. jar.

Sweet and Sour Pork is the newest product in the Chun King frozen Chinese food line.

Cockles and Mussels are bottled by Jones Brothers, Bristol, England. Shellfish have a three month shelf life in the vacuum-sealed 5-oz. bottles.



PACKAGING PLANNED FOR AUTOMATION

A single "off-size" box can halt your automated production line. Stay in the clear with Gaylord boxes. Precision-made of quality materials—they're your best choice for smooth, uninterrupted package flow.

Whether your operations are fully or semi-automated, Gaylord boxes help keep you profitably on the move. Contact your nearby Gaylord packaging engineer.

Gaylord Boxes

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES • KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS

DIVISION OF CROWN ZELLERBACH CORPORATION

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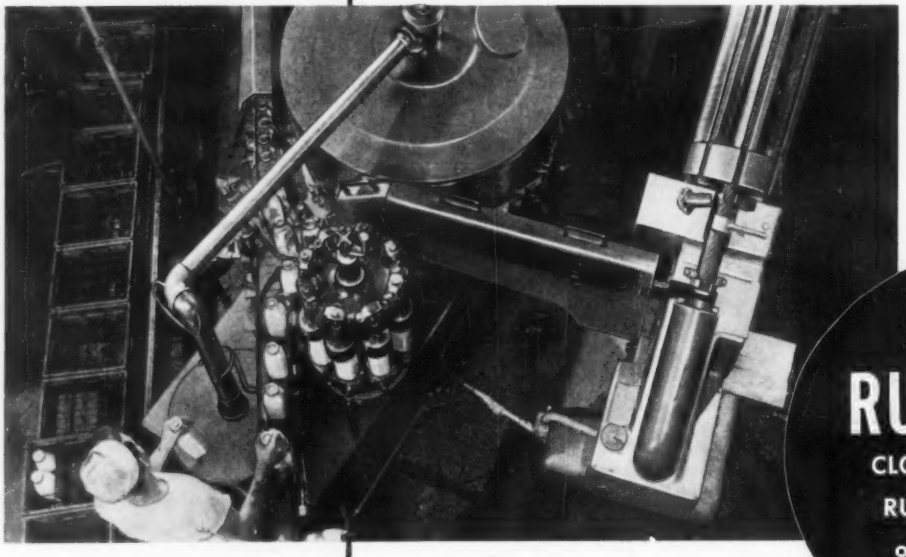
Rubatex Rings withstand 15″ to 19″ of vacuum during 8-hour periods — 150 strokes a minute . . .

Specification: RUBATEX CLOSED CELLULAR RUBBER (G-209-C stock ASTM-R-41) is specified material for selector head rings because its closed cellular structure gives it required softness PLUS excellent recovery properties so that rings will not collapse under 15″ to 19″ of vacuum during periods of 8 hours at speeds reaching 150 strokes per minute.

Rolls of nestled milk caps placed in feed mechanism of American Seal-Kap's automatic Seal-Hooder are separated by a selector head timed to the capping operation.

A RUBATEX CLOSED CELLULAR RUBBER ring on selector head holds one cap at a time under vacuum. Because caps have a series of ridges on top, rubber ring must be soft enough to give or recede under rolls, yet sustain vacuum sufficient to pull cap away from next cap in roll. The vacuum holds cap to selector head until released by a timing device. This operation must be instantaneous and a rubber ring must meet rigid requirements.



One of 27

RUBATEX

CLOSED CELLULAR RUBBER STOCKS on the job . . .

RUBATEX DIVISION, Dept. FE-7
GREAT AMERICAN INDUSTRIES, INC.
Bedford, Virginia

For full details and sample board—print your name in space below, attach to your company letterhead and mail to us.

Name_____

If you want more information about Rubatex, fill in and mail today.

IMITATION VANILLA BEAN FLAVOR BY FIRMENICH

Vanilla Bean Flavor by Firmenich stems from the vanilla bean. By original research, its components and desirable characteristics have been isolated, identified, and synthesized. By patient and painstaking laboratory techniques, they have been reconstructed for you in a precise and potent flavor material with all the aromatic qualities of the original. Vanilla Bean Flavor by Firmenich comes to you as an economical replacement of pure vanilla extract, of pure vanillin, or to use in combination in the manufacture of all products that you flavor with this most popular of flavors. Contains no coumarin.

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BULK FLOUR, BRAN AND WHEAT are among the products, weighed by these Richardson Model GGG-38 Scales in a leading Canadian mill. With a weight range from 100 to 300 lbs., these scales insure accuracy of ¼ of 1%, or better, of true weight.

The Class GGG-38, one of many Richardson Bulk Weighing Scales for the Chemical and Food Processing Industries.

All Richardson Scales conform to U.S. Weights and Measures H-44 for your protection.

Want to slice costs in weighing bulk materials?

Let Richardson Do It For You

Today's automated bulk materials handling systems demand scales that can give accurate, trouble-free service on the widest possible range of materials. That's why Richardson scales are used the world over—by chemical plants, food processors, feed and flour mills.

In unit weighing, process weighing or proportioning operations, you get:

- **REDUCED PRODUCTION COSTS** . . . weighing speeds suit any operation, pace production at economical level.
- **LONG-TERM RELIABILITY** . . . year-after-year rugged, accurate service.
- **SAVINGS IN TIME** . . . equipment stays "on stream," requires minimum maintenance or adjustment.
- **SAVINGS IN MATERIALS** . . . average accuracies of from 0 to ± 3 ozs. guard against losses.
- **SAVINGS IN LABOR** . . . completely automatic equipment means reduced labor and handling expenses.
- **QUALITY CONTROL** . . . accurate measurement keeps quantities and proportions constant.

There's a national service organization behind every Richardson application—to keep your scales in prime condition and to advise you on special weighing and materials handling problems. Let us put to work for you our more than 55 years experience in the business of materials handling by weight. For more information call or write us today.

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MATERIALS HANDLING BY WEIGHT SINCE 1902

RICHARDSON SCALE COMPANY • CLIFTON, NEW JERSEY

Sales and Service Branches in Principal Cities

Also Manufactured in Europe to U. S. Standards

COMMENTS & QUESTIONS

Execs Must Be "All-Sided" And Know Human Relations

Dear Editor:

The concept expressed in your editorial, "Be Whole Food Man—Not Management Cripple", has been the backbone of our human relations program since 1932.

We have a feeling that in America every person likes to belong to something, likes to feel that he or she is a part of the organization, association, club, or fraternity.

The feeling of being of service to your organization somehow gives self-respect. And no one can feel that he belongs unless he knows a great deal about what he "belongs to" and "what it stands for." Therefore, we have always tried to keep our executives, and those who would like to be executives, fully informed on all phases of the business.

We have shifted positions quite frequently to give the younger men a broad vision of the future. In exposing them to many different departments, we have served a double purpose. In many cases, we have not only stimulated the department, but we have been gratified by the fine education each of these men secures from the different department functions.

The executive of the future—in my estimation—must not only know his business, but he must have another quality—understanding of human relations. If the leader of tomorrow does not have the "loyalty" of those under him, he will not succeed as brilliantly as a "human-relations-minded" executive.

To train others is to learn how to lead, and to be led first is a prerequisite to leadership.

Therefore, an executive of tomorrow must be an "all-sided" man, with a deep knowledge of human relations, if he is to secure the best results from his "leadership" and "trusteeship."—*Charles P. McCormick, Chairman of Board, McCormick & Co., Inc., Baltimore, Md.*

Management Must Build Men

Dear Editor:

The advice in your editorial, "Be Whole Man—Not Management Cripple", is good. Industry everywhere needs broad-gage men.

While it is necessary for the individual to be able to look beyond his specialty and see the whole business in perspective, it is also necessary that he be encouraged to do so.

It takes a great deal of patience and coaching on the part of top management people to develop broad-gage executives who will have the capacity to succeed them.—*Harry A. Bullis, Chairman of Board, General Mills, Inc., Minneapolis.*

Dear Reader:

That management must encourage the individual to become a "whole man" is a significant point. Thanks for adding it to our comment.—*The Editor.*

Wants Letters From U.S.A.

Dear Editor:

I wrote to you about one year ago for some help on my new position as foreman. You gave me the names of two books to read, "Human Relations in Supervision," and "The Foreman's Handbook." I read both books and, in my opinion, they are very interesting.

Now I am looking for more ideas, as I would like another promotion.

It is my duty at the moment to learn as much as I can. And I would like to correspond with a foreman in another biscuit factory. Could you make it possible for me to do so?

I work in a biscuit plant and supervise a packaging department employing 80 women and operating two automatic weigh machines and sealing equipment.—*F. Gallett, 11 O'Neill St., Lily Field, New South Wales, Australia.*

Dear Reader:

We hope that publication of this letter brings your correspondence from the U.S.A. That you will receive another promotion, we do not doubt. Keep learning and you can't miss.—*The Editor*

Key is Communication

Dear Editor:

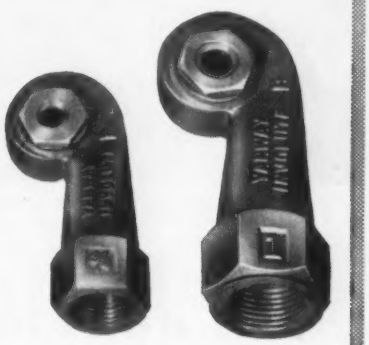
I am in perfect agreement with Paul Willis' article, "Trends Challenge Management." And I know that in this organization we are attempting to put all of these principles into practice.

I think the principal reason that we don't get all of these things accomplished is the matter of communications. Maybe we are doing a passable job in this respect, but I

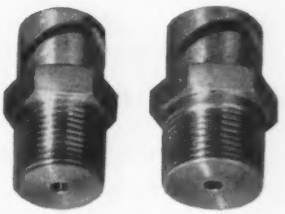
GET MORE OUT OF YOUR SPRAYING EQUIPMENT WITH LESS POWER

For spraying, washing, rinsing and cooling, Yarway Spray Nozzles will improve the efficiency of your spray equipment.

There are no internal vanes or other restrictions to clog or hinder the flow.



Cast bronze Involute-type (Bar stock also available)



Bar stock Fan-spray-type

Yarway Spray Nozzles are available in two types—the Yarway Involute producing fine hollow cone spray with minimum energy loss, and the Yarway Fan-spray for flat fan-shaped spray with time-saving slicing action for cleaning.

Ask for a free copy—Bulletin N-618.

YARNALL-WARING COMPANY
127 Mermaid Avenue
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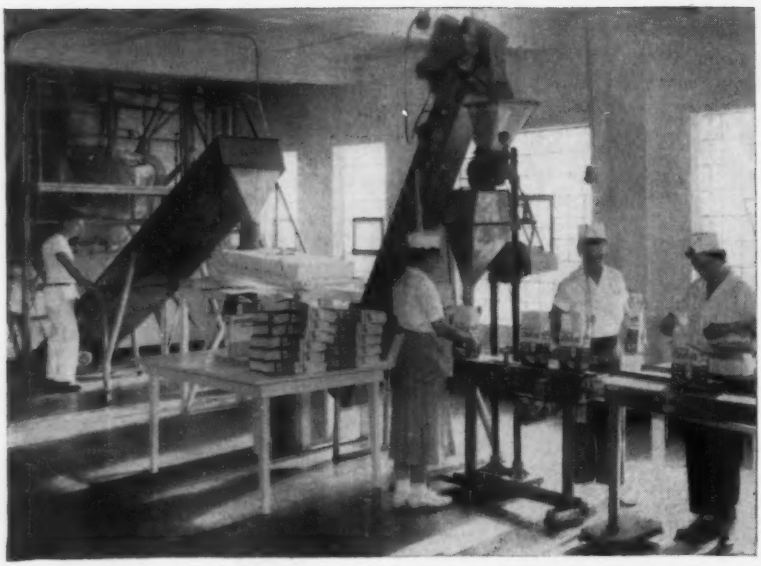
YARWAY spray nozzles



The instantizing and packaging line at the Farmers Coop Creamery in Ogilvie, Minnesota. Their nonfat product KWIK-LAC is active and successful in the Midwest consumer market.

You don't have to be big to produce instant milk...

But your profits will grow as soon as you go into INSTANT.

Instant milk powder is produced simply and economically with the Blaw-Knox Instantizer. Critical spray drying operations are not necessary to produce an "instant" product. Now, with new advances in the Blaw-Knox Instantizer you can produce a durable powder, free of product deterioration. True instantability with no off-flavor is gained by holding heat, moisture and process time to the minimum.

The Blaw-Knox Instantizer is effective on nonfat milk, chocolate blends, cocoa, and many other products which might require a low bulk density.

Specialty products earn premium prices.
Let Blaw-Knox experience work for you.

BLAW-KNOX

BLAW-KNOX COMPANY
Dairy Equipment Division
28 North Walnut, Mora, Minnesota

Comments & Questions

am pretty certain that there are a lot of us who will always feel that no matter how good a job we do, there is always much left to be desired.—*Dan Gerber, President, Gerber Products Co., Fremont, Mich.*

Power Consumption Varies

Question—In our multi-product food plant, we are presently engaged in a cost-reduction drive. One cost that we would like to pare is electric-demand charge, which seems high for the size of our operations. Could you suggest how we might go about this?

Answer—A very useful tool for such a purpose is a recording ammeter or wattmeter. And we suggest that you start by trying to obtain one. If you do not wish to invest in such an instrument for what may be a limited survey period, consult with a local electrical contractor, or your utility, about renting or borrowing one.

When this instrument is available, make a survey by installing it for a few days in each of your main power-consuming departments. In this way, you can get a picture of the pattern of power demand over a shift or complete day.

As you accumulate a set of these charts and compare them, you will doubtless observe characteristic peaks in the load curves. One very common condition is a considerable peak as the plant starts running at the beginning of a shift, and again after the lunch period. Other peaks will show up as a result of processes.

After taking the department load surveys, next step is to track down the particular equipment and operations in each department that contribute most to the peaks already observed. Here, you will note conditions such as power peaks for pressing and crushing. They are familiar to departmental workers, but may not have been considered in the overall pattern of the plant-power situation.

Once you know where the big power surges occur, you will be ready for the most important planning task—reduction of overall plant demand. Here is where you will be working with specific problems. However, we can make general suggestions that may be of help:

1. Stagger starting times of major power-consuming operations so that start-up loads do not occur at once.
2. Similarly, stagger lunch and

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ELI LILLY AND STANDARD OIL

thirty years as good neighbors in Indianapolis

I. J. Klingaman, Director of Eli Lilly Purchasing Division, and H. J. Kaufman, Standard Oil Regional Manager, stand before historic building on Lilly plant grounds. The Lilly Company had its beginning in this building more than 81 years ago.

FOR MORE THAN 30 years Eli Lilly and Company and Standard Oil have been industrial neighbors in Indianapolis. Standard Oil supplies petroleum products to this leading pharmaceutical manufacturer's McCarty Street plant and its laboratory at Greenfield, Indiana, a short distance from Indianapolis.

In the course of these years as a supplier, Standard Oil technical service has accompanied the sale of petroleum products. This service has been supplied by men with experience in engineering and in the use of petroleum products. Standard's man currently on the Lilly account is John T. Stark, a native of Indianapolis. For five years, ever since graduating from Brown University with a degree in chemistry, John has been calling at Eli Lilly. He had 17 weeks off this assignment in 1953 to attend the Standard Oil Sales Engineering School, where he received special training in the application of petroleum products.

But underneath this relationship between supplier and customer—the technical service rendered, the courtesies given and received, products bought and products sold—there lies something even deeper, something that is very good. It is the respect two industrial companies have for one another, which has endured to mutual advantage for 30 years.

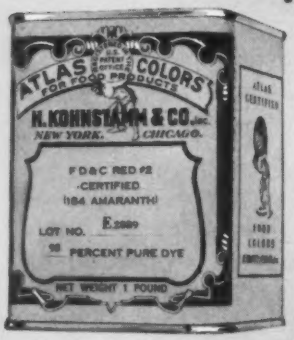
Perhaps your company has been a customer of Standard Oil's for many years. If not, we should like the opportunity to serve you as we have served Eli Lilly. We have 23 division offices in 15 Midwest and Rocky Mountain states. Call any of these offices. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY
(Indiana)

ATLAS *Certified* COLORS

FOR EVERY PURPOSE



New

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NON-SEPARATING TYPE
Powdered Certified Colors

100% BASIC COLOR BLENDS
that dissolve as a single color

for

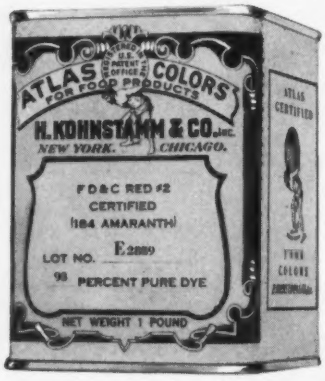
GELATINE DESSERTS
DRY DRINK POWDERS
and other types
DESSERTS and PUDDINGS

STOCK SHADES

ATLENE *Butterscotch Brown*
ATLENE *Cacao Brown (Chocolate Shade)*
ATLENE *Grape Shade*
ATLENE *Lime Shade*
ATLENE *Lemon & Lime Shade*
ATLENE *Raspberry Shade*
ATLENE *Root Beer Shade*
ATLENE *Medium Yellow (Egg Shade)*

also

"Custom Made" shades to
suit the individual needs.



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ATLAS CERTIFIED COLORS
(Powdered)

Industry's Standard for 105 Years

BASIC COLORS

HERCULES 100%
BASIC COLOR BLENDS

SECONDARY SHADES

plus

many "Custom Made" blends
to meet individual requirements.

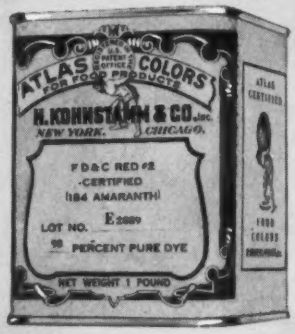
also

SELF-MEASURING
COLOR CUBES

PASTE COLORS

LIQUID COLORS

P. G. COLORS
for Summer Coatings and Fillings



New

FLOLENE

CERTIFIED COLOR GRANULES
Non-Dusting Type

FLOLENE Color Granules dissolve readily and with minimum dusting. Thus the possibility of contaminating other products is lessened.

Available in the Following BASIC COLORS

F D & C	RED	#1
F D & C	RED	#2
F D & C	RED	#3
F D & C	RED	#4
F D & C	YELLOW	#5
F D & C	YELLOW	#6
F D & C	BLUE	#1
F D & C	VIOLET	#1

All other Basic Colors
manufactured in powdered form.

FIRST PRODUCERS OF CERTIFIED COLORS

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BRANCHES IN OTHER PRINCIPAL CITIES OF THE U.S.A. AND THROUGHOUT THE WORLD

rest periods for plant departments.

3. Consider interlocks, timers, or program controllers to prevent unnecessary rapid starting (or operation) of several high-amperage machines, such as a battery of mixers that should operate in sequence to keep production flowing smoothly.

4. Look into possible uses of fluid drives or clutches to permit smaller motors to carry the loads.

5. Try to run well pumps to replenish reservoirs at night or other periods of low demand.

6. Reduce refrigeration power demands with ice-accumulation units operated in off-hours, where practical.

Browning Problem

Question—We've been experimenting with chicken and dumplings in 211x304 cans. But no matter how we prepared the dumplings, they always turn brown.

We tried 1oz. of rolled-type dumplings and 1 oz. of shredded chicken meat, then filled cans with a gravy of flour, broth, salt, pepper, MSG, and chicken fat. Dumplings were prepared with flour, baking powder, milk and salt.

We have tried several formulas and packed ingredients into cans in a variety of ways. Still the dumplings brown after retorting 40-70 min. at 240 F. Have you any recommendations?

Answer—Browning may be attributed to the Maillard reaction (between amino acids and reducing sugars) during thermal processing.

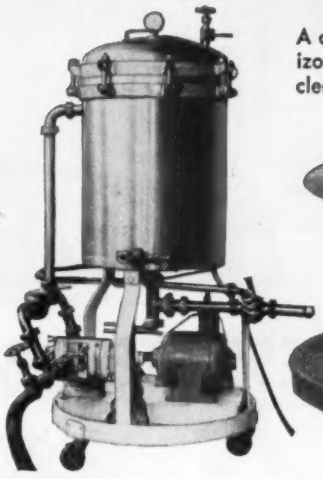
This was the experience of one of our readers, when formulating cream-style chicken stew and clam chowder with milk as an ingredient. It took place in the preparation kettle and was intensified after thermal processing at 240-250 F.

Browning occurred to its fullest extent directly after heat processing, and it was not a delayed reaction. To overcome this discoloration, it was necessary to substitute water for milk in the formulas.

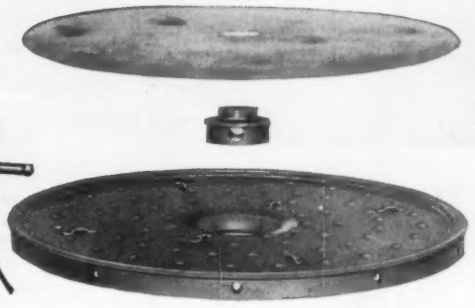
Preserving dumplings in their original shape is difficult. One canner tried it in a chicken-stew formula, but they disintegrated and disappeared into the sauce and made it thicker.

You might be interested to know that some firms are putting up frozen foods in which soda biscuits are used to simulate dumplings in meat stews, etc.

No locked-in contamination with SPARKLER SANITARY FILTERS



A completely sanitary filter. Sparkler horizontal plates can be disassembled for cleaning all interior surfaces.



You can see at a glance why Sparkler filter plates are the most sanitary plates ever designed.

All surfaces, inside and out, are easily accessible for thorough cleaning. The top screen that supports the filter paper, a center separator, and the bottom plate is all there is to it. These parts can be separated without unscrewing bolts or nuts. The tie rods of the complete plate assembly holds the plate parts firmly together without danger of bypassing.

With most other types of filter plates the inner surfaces are inaccessible and cannot be cleaned; contaminating food particles are locked in and the first run of a new batch frequently must be discarded or rerun through the filter to obtain a pure product.

With Sparkler sanitary plates, a pure product is obtained right from the start, and continues pure with fine sharp filtration to the end of the filtering cycle.

Sparkler filter plates can be removed for cleaning in one unit and a fresh thoroughly clean set lowered into the filter tank. This reduces down time to a matter of minutes.

Sparkler filters are available in stainless steel, monel, nickel, bronze, or Hastelloy, steam or brine jacketed. Available in a range of capacities up to 10,000 G.P.H.

They are efficient in filtering all food products such as:—

Candy Scrap
Chicken Broth
Cider
Egg Albumen
Extracts
Flavors
Honey
Gums
Liquors
Milk
Molasses
Syrups
Vinegar
Fruit Juices
Alcohols
Beverages
Lard
Deep Frying Fats
Beet Sugar Syrup
Beer
Wines
Whiskies

SPARKLER MANUFACTURING CO., Mundelein, Ill., U.S.A.

Sparkler International Ltd. with plants in Canada, Holland, Italy and Australia.
Service representatives in principal cities throughout the world.

FILTRATION ENGINEERING AND MANUFACTURING EXCLUSIVELY FOR OVER 35 YEARS.

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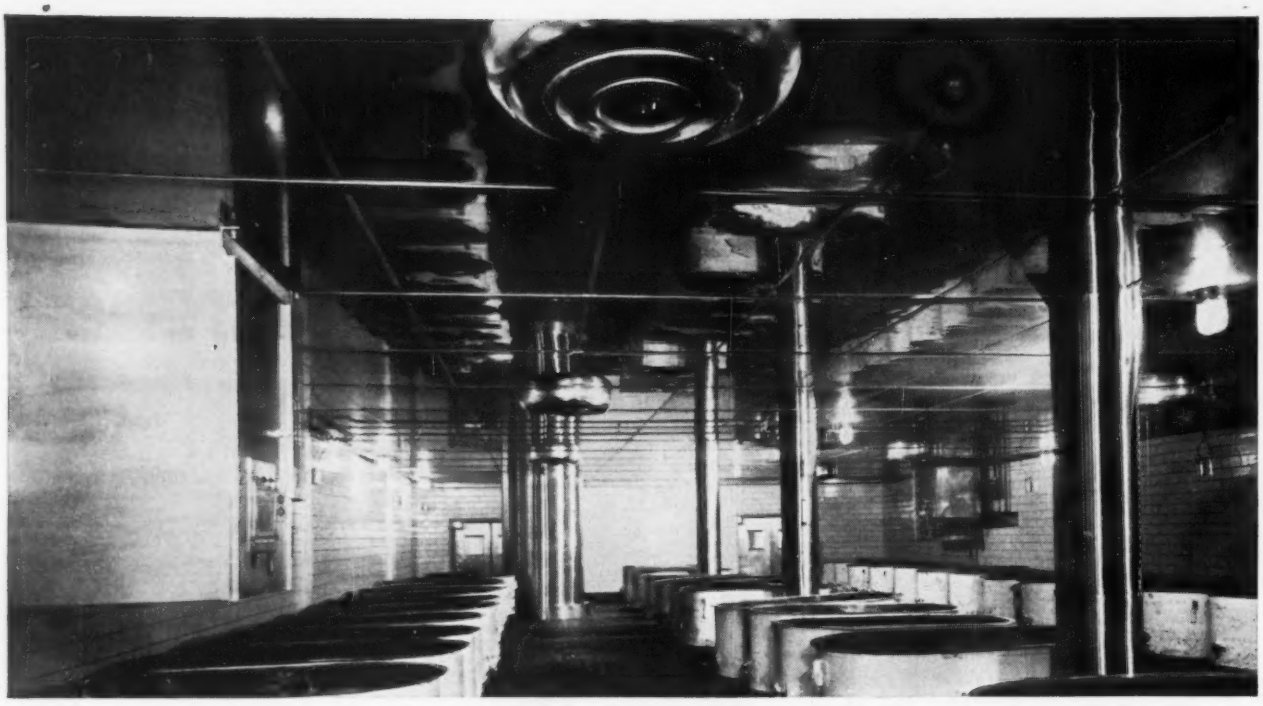


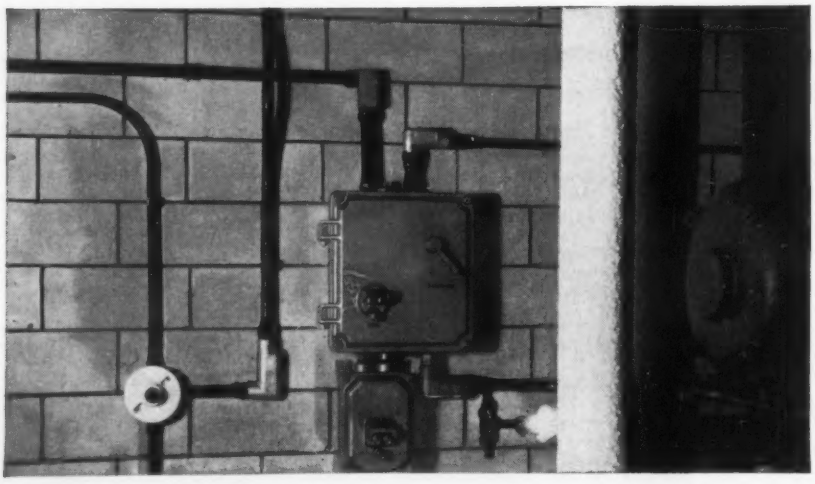
STAINLESS STEEL Pays for Itself in

Fermentation room fabricated from Republic ENDURO® Stainless Steel cuts maintenance costs, licks corrosion, assures uniform production and product.

The fermentation room, shown above, is used in a cracker plant for maturing cracker sponges. Operating at 80°F. the year around and in 70-78% relative humidity, the room could present a costly problem in corrosion and corrosion-caused maintenance.

But the manufacturer, The Fred D. Pfening Company, Columbus, Ohio, designed around this problem with Republic ENDURO Stainless Steel, Type 302, for insulated ceiling panels, duct work and air conditioning equipment. This type offers excellent corrosion-resistance and is unaffected by atmospheric attack. And the fact that ENDURO is solid stainless steel means that there is no applied surface to crack, chip, flake or peel.

One major user of this type of equipment reports



CONDUIT MAINTENANCE REDUCED TO A MINIMUM with Republic "Dekoron®-Coated" E.M.T. The corrosive action of vapors and moisture was causing rapid rusting of ordinary conduit in a cold storage plant. Replacement was frequent and costly. Then Dekoron-Coated Electrical Metallic Tubing was installed. In service for several years now, it looks as good as the day it was installed. A polyethylene coating over a galvanized finish provides double protection against excessive moisture, vapor and corrosive fumes. It can be cut to length and bent as easily as standard E.M.T. conduit. Joints are protected by plastic electrical tape. Also available in coated hot galvanized rigid steel conduit. Send coupon for details.

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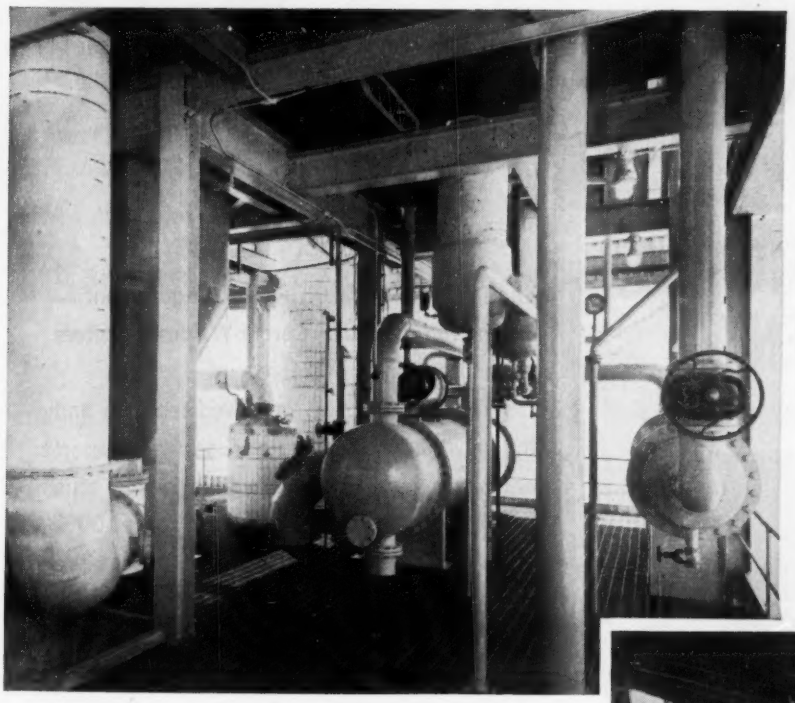
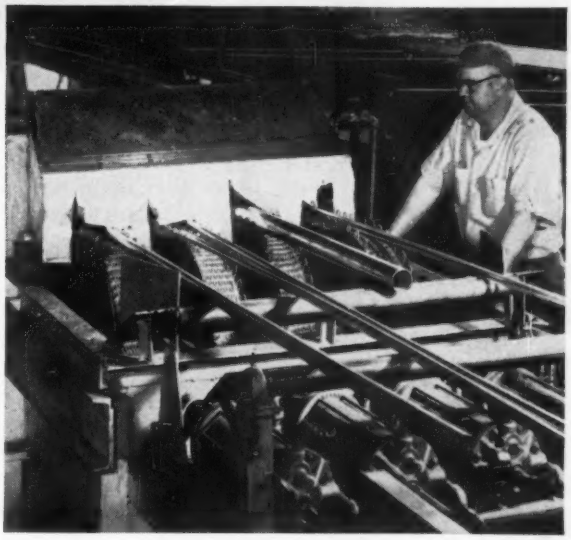


STAINLESS PAYS IN SOYA BEAN PROCESSING at McMillan Feed Company. In the condenser, shown above, ¾" O.D. Republic ELECTRUNITE® Stainless Steel Tubing meets the company's requirements for sanitation and corrosion-resistance. Stainless tubing eliminates the danger of metallic contamination. It is easy to clean and keep clean. Strong and durable, it saves time and money by giving maximum performance. ELECTRUNITE Stainless Tubing provides maximum resistance to temperature, pressure and physical damage. Send coupon for complete facts.

BRIGHT ANNEALED TUBING SAVES POLISHING COSTS. A new, continuous bright annealing furnace at Republic's Steel and Tube Division now makes it possible to obtain stainless tubing with a dense, lustrous finish—without paying high polishing costs. Tubing is produced with a hard, high-quality finish in sizes ¼" through 4" O.D. Formed from Republic ENDURO Stainless Steel, every foot of tubing has uniform wall thickness, is perfectly concentric, meets all requirements of ASTM and ASME. Mail coupon for more information.



Maintenance Savings

that their cost records prove stainless steel pays for itself in maintenance savings alone in just six years. Compared to less versatile materials that require frequent painting and other protective coatings, stainless is an investment in reduced maintenance and long-range savings.

Shouldn't you be enjoying all the benefits of stainless steel in your processing operation? Republic field metallurgists are ready to work with you and your equipment-supplier in applying the many available ENDURO Stainless Steel analyses to best advantage. Just mail the coupon.

The advantages of stainless steel are brought to you by Republic in behalf of the stainless steel process equipment manufacturers and the independent steel distributors (local steel service centers) who supply them.

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☐ ENDURO Stainless Steel
☐ Bright Annealed Tubing
☐ ELECTRUNITE Stainless Steel Tubing
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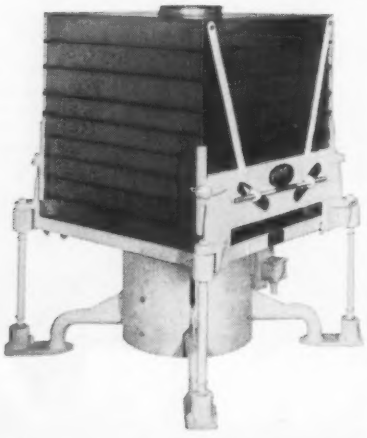
GET SPROUT-WALDRON'S Big Plus in

SIZE CLASSIFICATION EQUIPMENT

The famous line of RICHMOND equipment — now manufactured by Sprout-Waldron — offers you more than ever before.

In addition to new, improved features and the most advanced designs, you get expert engineering guidance on installation . . . plus finest workmanship and service . . . plus 100% reliability. These extra BIG PLUS values are yours at no additional cost with RICHMOND-SPROUT-WALDRON equipment. Write for complete details.



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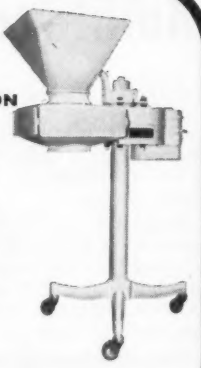
GYRO-WHIP SIFTERS

They're amazingly compact, yet sift in huge volumes – real space savers. Simplified design cuts maintenance and cleaning time and makes possible the utmost sanitation. Available in many sizes. Stainless steel and wood construction. Write for Bulletin 135-A!



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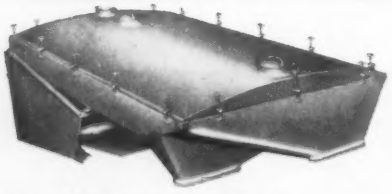

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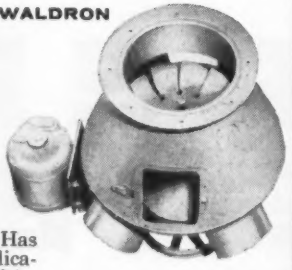
GYRO-SHAKER

Big capacity. Screen readily accessible. Low headroom requirements. Carbon steel construction – stainless steel parts available. Dust-tight – can be made gas-tight. Write for Bulletin 160!



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STREAM SPLITTER

Splits one stream into two to eight equal divisions. Handles all types of free-flowing materials. Requires little space. Easy to install. Has many money-saving applications. Get full details. Write for Bulletin 137!

EQUIPMENT FOR SIZE REDUCTION, MIXING & BLENDING, PELLETING & CUBING, BULK MATERIALS HANDLING, PRODUCT CLASSIFICATION.

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Canners Must Make Their Own Breaks in Future

"The recent gloom and doom attitude of canners is being replaced by cautious optimism." In that one statement, retiring NCA President A. Edward Brown put his finger on a multitude of factors significant to the food industry.

Why the gloom and doom? A. C. Nielsen, Jr., explains it this way: (1) The number of canneries has been declining. (2) Some recent profit and loss statements have been relatively unsatisfactory. (3) Many new competitive forces are appearing on the horizon.

And why is gloom being replaced by optimism? Let's quote President Brown: "A strengthening of demand indicates that there may now be a lessening of the cost-price squeeze that has reduced profits."

Economic indicators buoyant

Several economic factors are involved. Among them are increased defense spending, high level of retail sales, and increased sales of life insurance. Others are more construction activity, record high electric power output, and easier money.

But more directly related to the fortunes of canners is the recent freeze in the South. It has strengthened demand for canned foods.

So the canners will come through the recent squeeze. But relief will be temporary for many unless they change their business ways.

There is too much production of products that are too equal in quality—and too uniformly priced because of standardized costs.

Increasing population and higher consumption of convenient processed foods will help to ease the situation—but not fast enough.

No, canners can't continue to do business as usual. And here are some changes they and other food processors should consider:

1. Go for extra quality—at a price high enough to return a fair profit.
2. Develop and test-market new products, but don't duplicate existing items without improvement.
3. Keep well-informed market-wise, so quick decisions can be made to protect profits.
4. Gear your business to making a profit, not to selling all you can at low prices.
5. Upgrade your selling to do a better job on fewer, larger buyers.
6. Extoll canned foods as the wonderful convenience buys they are.
7. Provide better service through dispersed warehousing facilities.
8. Develop more sales aids for brokers and field salesmen, and provide point-of-sale support.
9. See that product and package are attractive—have sales appeal.
10. Tell consumers why your products are high in quality, and convenient.

Success based upon better plant

But don't forget that you can't sell quality unless you produce it in the plant. And you can't put even a reasonable price on quality unless you have an efficient plant.

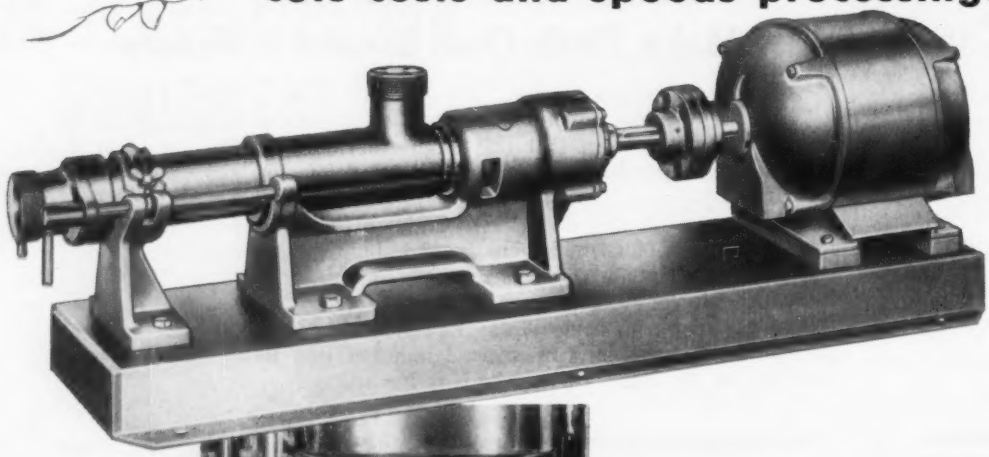
Too many food processors fail to appreciate the business advantages of better equipment—fail to realize that they can't afford to be without it. And we know of only one that recently has advertised a new process to boost sales.

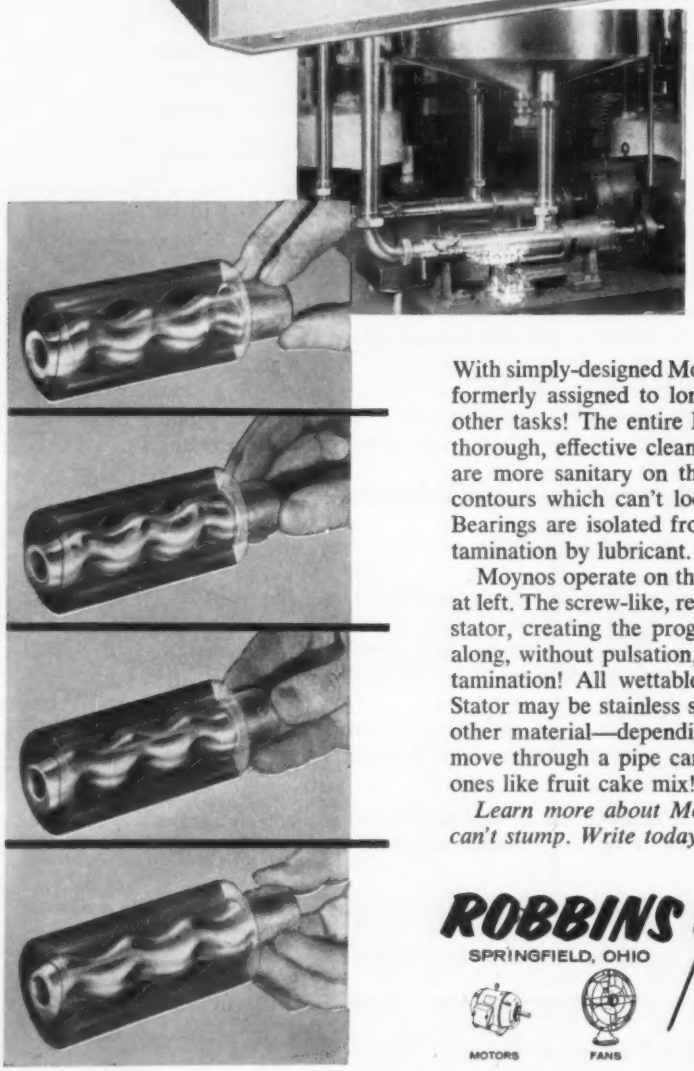
Buttress your business from bottom to top. Next time gloom may lead to doom.

Quick cleaning

MOYNO® FOOD PUMP

cuts costs and speeds processing!





"Progressing cavity" principle . . . pumps everything from hamburger to potato salad!

With simply-designed Moynos pumping your food products, workers formerly assigned to long, costly pump cleanups can be used for other tasks! The entire Moyno unit can be quickly dismantled for thorough, effective cleaning and re-assembled in minutes. Moynos are more sanitary on the job, too. Pumping element has smooth contours which can't lodge particles where bacteria might thrive. Bearings are isolated from pumping compartment to prevent contamination by lubricant.

Moynos operate on the "progressing cavity" principle, illustrated at left. The screw-like, reversible rotor revolves in a double threaded stator, creating the progressing cavities. Material moves smoothly along, without pulsation, aeration, agitation, disintegration or contamination! All wettable parts, except stator, are stainless steel. Stator may be stainless steel, synthetic rubber, odorless bakelite or other material—depending on service. Any food product that will move through a pipe can be pumped with a Moyno—even lumpy ones like fruit cake mix!

Learn more about Moyno—the quick-to-clean pump that food can't stump. Write today for Bulletin 30-FE!

ROBBINS & MYERS, INC.

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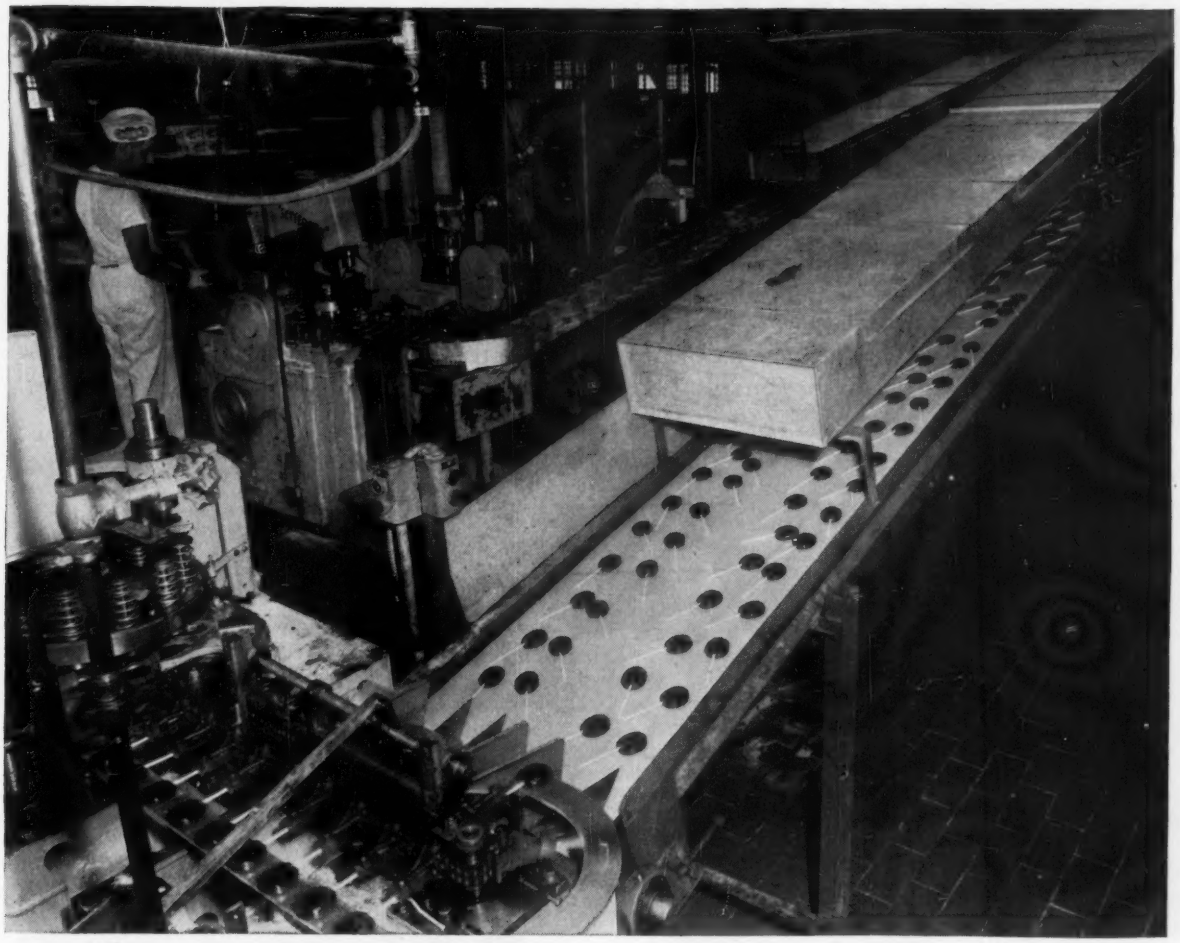
B.F.Goodrich report:



Koroseal keeps millions of lollipops on the march

A typical example of B.F.Goodrich product improvement

Problem: In this plant, lollipops by the millions are made without ever being touched by workers' hands. Conveyor belts carry them from the machines that form them to other machines where they're wrapped and packaged. At first, belts made of canvas were used. But, too often, the hot, tacky candy would stick to the canvas, cause messy jam-ups.

What was done: When a B.F.Goodrich distributor learned of the problem, he recommended belts made of Koroseal flexible material. The Koroseal belt has a smooth, polished surface. Even hot candy won't stick to it, food particles can't grind in. It has no odor, no taste, never gets rancid. Koroseal belts are as clean as your dishes at home and just as easy to wash.

Savings: In the past two years, B.F. Goodrich belts have kept millions of lollipops on the march, without jam-ups or trouble of any kind.

Extra benefits: Because it's made of Koroseal, this B.F.Goodrich belt stands grease, cooking oils, most acids —and just about everything else that ruins other belts. It resists cracking and peeling, never gets soft or sticky.

Where to buy: Your B.F. Goodrich distributor has exact specifications for the Koroseal belt described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the products B.F.Goodrich makes for the food processing industry. *B.F.Goodrich Industrial Products Co., Dept. M-266, Akron 18, Ohio.*

Koroseal—T. M. Reg. U. S. Pat. Off.

B.F.Goodrich

INDUSTRIAL PRODUCTS

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SEE the Maintenance-Cutting Quality in LUNKENHEIMER N-M-D

You can actually *see* quality in every feature of Lunkenheimer N-M-D (Non-Metallic Disc) Valves—from the exclusive Non-Slip® handwheel and perfectly-machined stem threads to the rugged bronze body.

The unretouched photo tells part of the story. But you cannot see the difference between a Lunkenheimer Valve and an ordinary valve unless you actually compare.

Your Lunkenheimer Distributor will be glad to show you the difference.

Let him match a Lunkenheimer N-M-D—part-for-part—against any valve you are using for similar service. See for yourself the precision workmanship and advanced design that pay for themselves many times over in lower maintenance costs... or write The Lunkenheimer Co., Cincinnati 14, Ohio.

LUNKENHEIMER QUALITY

LUNKENHEIMER®
THE ONE *Great* NAME IN VALVES

FOOD ENGINEERING FEBRUARY 1958

Simple *twist* on 5-step work-saving formula

Puts Your Problems to Rout

Tackled the common "Bill Rogers way," things that go wrong are too likely to stay wrong . . . But with the systematic approach described here you can get the best remedies quickest

PROBLEM SOLVING takes a lot of costly time—often the time of as many as ten management people. And the cost of problem solving has become so high in time and dollars that we must look for a better or more systematic way of doing it.

Such a systematic approach is at our disposal. It is the Work Simplification philosophy promoted by A. H. Mogensen and followed at Wagner Baking Corp. by Don F. Copell.

It has been defined as the "organized use of common sense to find easier and better ways of doing work"—or, as we might add, to more easily find the correct solution to a problem. The organized approach to such work saving follows a five-step plan (see panel on p. 51).

To illustrate how this also can be applied to solve non-production problems, let's take a practical example from the baking field. This is a real problem, but the names of the people involved are fictitious. First, we'll consider the all-too-common approach:

Sales Manager Bill Rogers is faced with excessive stale-returns—too many products taken back to his bakery unsold after maximum time on the retailers' shelves.

Bill decides that group action is necessary, so he calls a meeting of his assistants and supervisors. He opens up with a statement of the problem: "Fellows, our stale-returns are too high."

He then amplifies, of course, by showing how much too high. He uses charts to emphasize the seriousness of the situation. But when he sits down, after speaking 20 min., he actually has done no more than state the problem. And things are at a critical point.

We have observed many managers do what Bill does at this particular point. Having become steamed up in outlining the trouble, he immediately asks "Now what can we do to reduce our stale-returns?" And in posing that question he has greatly reduced his chances of getting the correct solution. Not only has he sought an answer to the matter prematurely, but he has not been systematic about it.

Since there usually are many more wrong than right answers, it is very easy, in the panic, to come up with a "solution" that doesn't work. Hence, Bill likely will have to hold another meeting soon on the same problem—possibly several additional sessions.

But he could avoid such costly waste of time—by adopting a philosophy which has been found to be very sound over the years. It is this: An *organized* approach to any problem will uncover the best answer more times, with less total effort, than the haphazard approach of trial and error. This is the Work Simplification philosophy.

In solving his problem, Bill would follow the five steps this way:

STEP I—Decide on the exact problem to be solved. That's easy. Bill's problem is stale-returns.

STEP II—Identify his problem. This was the step completely missed by Bill. After stating the trouble, he should have asked his group: "What in your experience are *all* of the factors which might conceivably be making our stale-returns abnor-

FRANK A. BUSSE

Director of Personnel, Quality Bakers of America Cooperative, Inc., New York City

Appointed in 1948 to organize the first department of QBA to offer personnel service to member companies, Mr. Busse's principal function has been to assist members in the preparation, adoption, and continuing evaluation of a program of personnel administration.

Effort of the department under his direction has resulted in a complete employment program, including testing for hiring and upgrading, performance rating and review, selection and development of supervision, and methods improvements through work simplification.

Mr. Busse holds a degree in engineering and a license to practice professionally, also an adjunct professorship in management at Newark College of Engineering. Further, he is an author and lecturer, as well as a member of, and guest speaker for, the American Management Assn.

FLASH **Checklist of 2 Routines**

	In Work Saving You	In Problem Solving You
STEP I . . .	Pick the Job	Decide on Problem
STEP II . . .	Break Down Job	Identify Problem
STEP III . . .	Question All Details	Analyze Problem
STEP IV . . .	Develop New Method	Develop Plan
STEP V . . .	Apply New Method	Work the Plan

mally high? Tell me all the things you can think of and I'll write them on the blackboard."

With the responses to the question, Bill might develop this list—

Forcing the market, weather conditions, vacations of salesmen, competitors' activities, quality and appearance of merchandise, new route salesmen, overloading, poor ordering, poor distribution.

A complete tabulation contributed by an experienced group likely would include the cause or causes of the problem.

STEP III—Analyze his problem. Bill now says to his group, "You men are out there in the market, close to the problem of the stales. Of all these possible causes, which do you feel is the most likely one?"

This is the questioning step:

What? Where? When? Who? How? And above all—Why?

And the questioning can only progress in an atmosphere of open-mindedness on the part of all. This is no time for any of the group to think "it can't be done", "it won't work", "we tried it before", "we've never done it before", or any of the many "idea chillers" that so quickly become "idea killers".

Analysis of the items in the list Bill developed in Step II might proceed as follows:

Forcing the market. No deliberate action of this kind. Might have occurred in an isolated case, but would not account for the consistent rise in stale-returns.

Weather Conditions. Very similar to those of a year ago, at which time there were no abnormal stale-returns.

Vacations. Period in question covered several months in which number of route salesmen taking vacations decreased. Nevertheless, it was revealed that supervision had been reduced 20% due to covering the routes of those on vacation. However, these particular routes were not running abnormally high stale-returns.

Competitors' activities. Competitors are usually active—but here there had been no abnormally heavy advertising campaigns or other "breaks"—no additional competitors had entered the market.

Quality and appearance of merchandise. Daily sampling of merchandise in the market revealed consistently high quality and excellent appearance. New equipment in wrapping department had actually improved appearance.

New route salesmen. Ten new men had been hired in the past four months of which two had since left. In other words, eight routes were now manned by men hired, trained, and put "on their own" in the past four months, five of them within the past two months. Further analysis indicated about 35% of the abnormal stale-returns coming from these eight routes, with much of it due to poor ordering by these newer men. This might also account for poor distribution and overloading.

Ten men out of a total complement of 68 in four months is higher turnover than normal, but might have been handled without difficulty had it not been for reduced supervisory attention because of vacation substitutions. This had undoubtedly damaged the training of the new salesmen.

Here then, is the first point of attack for Bill and his group. They conclude that, while other factors may have contributed slightly to the condition, it is in this area of "new route salesmen" that the greatest improvement can be shown.

STEP IV—Develop plan for solution. This is an important step since it calls for a *plan*. In terms of the analytical picture developed in the preceding step, Bill and his group might put it as follows:

"We have nine supervisors and eight new men who apparently need attention. If we temporarily place the new men in the hands of two supervisors, we can redistribute the remaining 60 men under the other seven supervisors for normal supervisory attention.

"Supervisors Joe Brown and Ray McArdle have agreed to take the new men (four each) for concentrated attention and training aiming at reduction of the stale-returns.

"Allowing the next two days to work out details, this plan will start on Monday of next week. We should reasonably expect a stale-return reduction of 50% for these eight men by Saturday of the first week, and the balance reduced to normal by the end of the second week."

STEP V—Work the plan. Just as in specific work simplification problems, other people are involved. They cannot be expected to carry out the plan just because we say so. They will have to be sold.

The Human Side

"When a person is confronted with a problem, the intelligence of his action is dependent on three primary factors:

1. His *desire* to solve it.
2. His *ability* to solve it.
3. His *capacity* for handling the human relations involved."*

Desire: Most managers have the desire to find answers to their problems. The big trick is to get others to have the same desire. There are only two reasons why most of us do anything:

1. Because we desire to *gain* something.
2. Because we desire to *avoid losing* something.

Most people feel that they can gain something by helping the manager arrive at solutions to his problems more quickly and more accurately.

Bill's nine supervisors, and even his 68 route salesmen, will understand (or can easily be convinced) that abnormally high stale-returns not only make their jobs more difficult but seriously cut their pay.

Ability: We have observed many cases in which tremendous ability

* William J. Reilly, *The Law of Intelligent Action.*

came to the fore when the opportunity was provided in the proper management climate.

Bill Rogers and his nine division supervisors together represented a minimum of 150 yr. of experience.

Capacity for human relations: It is human nature to resist change and to resent criticism. And, unfortunately, the answer to most problems will represent a change for some people, and be taken as criticism by others.

However, changes can be brought about if we remember the gyroscope. It will resist a sudden change in position with unbelievable force. But its position can be completely changed if it is done slowly.

As described, Bill Rogers has now worked out a plan to meet the stale-return problem. But there are certain human relations factors.

For example, starting Monday and for two weeks, each of the nine supervisors will have a somewhat different group of men in his division. This will be a change for each supervisor, and may be taken by a few as a form of criticism.

However, the resistance to change or the inference of criticism has been reduced, since the analysis of the problem and resulting plan were produced by thinking of the group.

Consulting is a real aid in each of the five steps of either work simplification or problem solving. Of course, we must "ask ourselves" first. But we must be sure to consult others, too, especially those who may be directly involved. They are the ones who will make or break the new method or the solution to the problem. They have ideas—so don't forget to get them into the act.

It is not infrequent that the man doing the job knows more about it than anyone else. The more all concerned can add to developing the new method or to the solution of the problem, the better it will probably work. When everyone believes something will work better, it probably *will* work better.

Despite the fact that Bill Rogers admittedly introduced potential human relations problems when he and the supervisors developed their answer, the mere allowing of group discussion would have tended to reduce resistance to a minimum. In fact, all chance of resistance might have been eliminated, had each supervisor conferred with his salesmen.

In any case, no one can resist a new idea when it is partly his, nor can he feel criticized when asked to follow a new answer to a problem if he himself helped develop it.—*End*

Work Simplification follows this five-step plan . . .

STEP I—Pick the job

STEP II—Break Down the Job

This move gets right down to the bedrock of how a supervisor can eliminate waste or improve work methods. To study a complete job properly, every detail of the job must be listed exactly as it is done.

STEP III—Question Every Detail

Now that our job is broken down, next step is to ask "Why?" In short, each item in the break-down must undergo the following third degree:

The Facts	WHAT is done?	WHY is it done?	The Reasoning Behind The Facts
	WHERE is it done?	WHY done there?	
	WHEN is it done?	WHY is it done then?	
	WHO does it?	WHY does he do it?	
	HOW is it done?	WHY that way?	

STEP IV—Develop the New Method

This means decide on a better way. If we've done a good job of "WHY-ing?" the details, some parts of an improved method will be revealed quite readily. The formula goes—

WHAT? and WHY?	.....*lead to*.....	ELIMINATE
WHERE? WHEN? WHO? and WHY?	.....*lead to*.....	COMBINE and/or CHANGE SEQUENCE
HOW? and WHY?	.....*lead to*.....	SIMPLIFY

STEP V—Apply the New Method

Before the new way can be put to use, we may have to "sell" it to other people—both up and down the line. Therefore, what it will do should be written up in detail. And you should credit others who contribute.

Cites Plant Management's Sanitation Responsibilities

SUCCESS OF ANY PROGRAM depends upon having a plan and then working on that plan. This is especially true of food-plant sanitation programs.

Just as it is known that you cannot *inspect* quality into a product, neither can you inject quality into an inspection program without planned control.

The only practical and economical basis for obtaining planned, sound control is the establishment of effective and dependable routine—day-by-day sanitation procedures, of the type specified by the American Institute of Baking.

For this to be effective, a plant's management—as well as those responsible down the line—must develop an open-minded, receptive sanitation attitude. Management can do a great deal to promote and maintain this attitude by insisting upon good housekeeping practices throughout plant and premises.

3 Prime Points

Management must: (1) Be convinced of the absolute need of sanitation, (2) recognize that it is a condition that is not attained by wishful thinking, (3) be willing to spend money to keep its plant and equipment clean and orderly, modern, and efficient—to mention a few of the requisites.

Only then will it lead the way in creating the proper sanitation attitude. And employees will thus gain more respect for the product they are producing, and take pride in the part that they are playing in its production.

It has been our sad experience, however, that plant employees too often lose sight of the important fact that they are working with and producing human food. This lack is more often prevalent in plants where management itself fails to have the proper sanitation attitude.

The statements above are excerpts from "The AIB Sanitation Program," a talk delivered by Shelbey T. Grey, director, Bureau of Program Planning & Appraisal, FDA, Department of Health, Education & Welfare, at the recent annual meeting of the American Institute of Baking held in Chicago, Ill.

"FINEST AND MOST MODERN" is the way they hail GF's new Research Center situated on 55-acre site overlooking Hudson River at Tarrytown, N. Y. Administration building is seen in left foreground, while Science and Development buildings, respectively, stand in middle distance and far right.

How Research Sparks Business

Speeds growth—at GF 35% of sales is in new products. Guides business decisions while solving technical problems. GF teams central and division research effectively. Builds new center.

ROY H. WALTERS
Vice-President, Research, General Foods Corp., White Plains, N. Y.

GREAT STRIDES have been taken by research and development in the food industry. The demand by housewives for greater ease in preparing better and more varied menus for their families has produced a steady flow of new items from food laboratories to the grocer's shelves.

It is estimated that the average supermarket now carries about 5,000 separate food items. A decade ago, the average number of food items stocked was about 3,000. Looking to the future, estimates indicate that by 1960 the number will rise to 6,000 items.

The work of the manifold food research and development laboratories comes into sharper focus when we look at the number of new food items offered grocers each year. The average retail grocery chain is offered about 150 to 200 new food products each week, or 7,500 to 10,000 new products in the course of a single year.

In 1957, these new products represented a research expenditure by the nation's food industry of between $90 and $100 million—almost double the $58.3 million spent by food manufacturers in 1954. This amount does not include the considerable sums expended for food research by various government agencies and food-industry suppliers.

GF's Research for Growth

At General Foods, research has become an integral part of the corporation's growth pattern. In the fiscal year ended March 31, 1957, sales of new products introduced or acquired by GF since World War II amounted to $345.4 million, or 35.6% of net sales. In 1952, just five years ago, sales of new products amounted to $75.6 million.

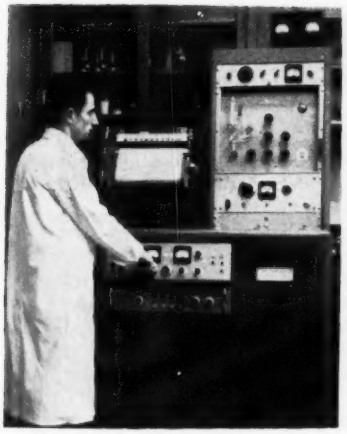
These figures reflect the dynamic impetus research injects into the corporate sales picture. Research and development at GF does not try to create any illusion that this growth is the result of its work alone. Research is but one part of GF's overall, integrated operations.

Aid in Business Decisions

Here, all management levels—corporate, division, and product-manager—participate in the planning and development of research programs, from pioneering research into basic food elements to improvement of present product lines.

Our technical research is a function frequently used in making business decisions. Not every business decision requires the facts gained through research and development, of course—but for those that do we have organized research so that the technical facts can be developed efficiently, accurately, and quickly.

Advanced facilities in action



Mass Spectrometry
—analyzes various substances, checks flow characteristics.

Photo Microscopy
—determines behavior of fats, reveals changes in food structures.

Paper Chromatography
—separates and identifies unknown amino acids and sugars in materials.

We have decentralized as well as centralized research. This provides us with what we believe to be the most effective research setup to assure continued growth and profitability.

Some information on our corporate structure is necessary to provide a background for an understanding of our research organization.

There are twelve operating divisions, each headed by a vice-president or general manager, and operating quite similarly to a separate company. Each manager is responsible for production, advertising, sales, research, and other business functions of his division. In this way, he is responsible for the profits of his division.

Corporate management, through operations vice-presidents and staff departments, supplies divisions with counsel and general direction in those areas that are common to the corporation as a whole, and where conformance with overall policies is necessary.

Short- and Long-Range

In determining the direction and level of research, two basic factors predominate:

1. Short-range company goals and needs.
2. Long-range company goals and needs.

The short-range company goals and needs are carried on primarily in our twelve divisional laboratories. Each of these laboratories is under the direction of a research manager who is part of the division staff organization and has line responsibility for his operation. This we term *decentralized research.*

Long-range company goals and needs are provided for in our Research Center under line supervision of the vice-president, research. Besides conducting research for the corporation on its broad objectives, the Center organization supplies research service to the divisions. This corporation and division work we classify as *centralized research.*

To understand how short- and long-range company needs are achieved through GF research, here are broad classifications:

1. Division work at divisional laboratories
2. Division work at Research Center
3. Corporate research work at Research Center

These different types of research do not require a different organization, but the type of work assigned to a division laboratory or the Research Center must be amenable to the research organization where assigned, if it is to be done most effectively.

Organization of Labs

The divisional laboratories are organized along product lines. That is, the laboratory personnel are specialists in the division's products —they have developed a "feel" for these products and have a background of general and specific knowledge about them.

On the other hand, the Research Center is organized around technical specialists, such as organic chemists who can work on any problems in their scientific area, regardless of the product or process involved.

Basic Difference

This one thing is the basic organizational difference between the centralized and decentralized laboratories, and determines to a large degree the types of research work that each group can do best.

The division groups, because of the product knowledge they have, can more effectively work on product improvements than can the Research Center. In the division, there not only is the background knowledge held by the researchers available, but also close at hand is that known by marketing, production, and other groups.

Accordingly, a division laboratory can most effectively work on those problems that are product oriented. For instance, the development of a new flavor for an established product line can best be done at a division laboratory, where the research group has a background of knowledge about the product and its properties.

While the Research Center assists divisions with their research problems, its main job is to explore those areas which might lead to profitable new business opportunities.

Direction of this latter effort is centered in the vice-president, de-

". . . Such development of new business opportunities we term pioneering research . . . Our scientists complete the exploration . . . which leads to a new-product concept."

velopment. Reporting to him are the director of new products, director of acquisitions, director of GF Kitchens, and vice-president, research.

Such development of new business opportunities we term pioneering research.

When our scientists complete the exploration of an area of technology which leads to a new product concept, the findings are transferred to the new products department for further evaluation and product development.

Before a major research effort can be pursued to its fullest, it is reviewed by a research council composed of top officers. These officers evaluate the findings. If their judgment is favorable, priorities and funds are allocated.

New Research Center

Our new GF Research Center in Tarrytown, N. Y., was planned and organized with the knowledge that exploratory research would be one of our major functions.

To accomplish this, the Center is organized and administered in four groups—chemical research, technical services, product development, and engineering research. Each group is under the direction of a technical director, who reports to the manager of the Research Center.

Chemical research encompasses biochemistry, organic chemistry, nutrition, and radiochemistry. These groups accumulate scientific knowledge of the physical and chemical characteristics of raw materials to enable the development of new and improved products and processes.

Chemical-research functions involve such studies as flavors, food textures, nutritional studies, suitability of new ingredients for food use, and exploring of selected areas of technology for new raw materials for food use.

The technical services organization provides chemical and physical analyses, product evaluation, packaging, organoleptic testing, and statistical design of experiments.

This section uses various types of equipment in its studies to make physical measurements of all kinds, using such means as X-ray diffraction equipment and mass spectrometer. Technical services also tests food samples for odor and taste differences from known standards under controlled conditions—in stores, in homes, and in the laboratory.

Big P. D. Staff

The product development area is the largest in terms of personnel, and has the important task of bringing technical knowledge into physical form.

This group works on the creation of new products or the improvement of present products when studies call for selection and utilization of raw materials, development of processing techniques, and improvement of products in terms of texture, color, flavor, performance, and storage stability.

Engineering research works in manufacturing processes, from bench-top operations to full-scale equipment. Here, studies range from pilot-plant development of new manufacturing processes to putting the new production methods into operation.

The new Research Center consists of three main buildings—Administration, Science, Development—set in a campus style on a 55-acre tract overlooking the Hudson River near the Tappan Zee bridge of the New York Thruway.

These buildings provide working space for approximately 650 scientists, engineers, technicians, administrative, and other supporting personnel. Total area in these buildings is approximately 252,000 sq. ft.

Largest of the buildings is Development, which contains more than half of the laboratory space and houses product development and engineering research.

Has Flexible Pilot Plant

Included in this building's equipment is a high bay area and pilot plant which closely approximates the size and conditions encountered in production processing. This large equipment allows us to move much more quickly from acceptable samples to plant design, and to do it with a greater degree of certainty.

A maximum of flexibility has been built into our development equipment, allowing us to move from one pilot plant setup to another almost as quickly as from one bench-top glassware setup to another.

The Science building, of some 71,000 sq. ft., is the next largest unit, and contains the chemical research and technical services group. This structure is built in the shape of a "Z", with laboratory bays in the wings and offices in the center.

Conditioned storage and work rooms on the ground floor provide facilities to study temperature effects, from 100F. to −40F., and with humidity control as well.

The third building houses the administrative offices, cafeteria, assembly room, personnel, and medical department, as well as service area. Also, building includes the library, which contains more than 67,000 books, pamphlets, reports, records, and periodicals.

More Division Research

In addition to opening the new Center this year, the company has provided new and enlarged facilities for most of the major division in the past year.

At our Post Cereals plant in Battle Creek, Mich., a new engineering and research laboratory has now replaced an older building.

Prior to the opening of our Central Laboratories at Hoboken, N. J., in 1939, the Post facilities also served as the company's general research laboratory.

Another major division-laboratory expansion was completed at our Atlantic Gelatin plant in Woburn, Mass. With the closing of Central Laboratories, these facilities were turned over to the Maxwell House Division for increased research into coffee.

This combination of facilities and personnel in our centralized and decentralized operations provides us with the tools to do a more effective and significant research in the food field.

General Foods is investing more facilities, more manpower, more funds, and more concentrated attention upon new products today than ever before in its history.

We believe that much of our long-range growth will stem increasingly from new products. —End

FULL-PAGE COLOR newspaper ad promoting Sara Lee's latest offering—all-butter chocolate brownies—is given careful check by President Charles Lubin (left) and Executive V.-P. Mandall Kaplan. Mouth-watering illustration of quality product is prominent element for stirring consumer appetites. Company also uses TV, radio, and special store displays.

Small Plant's Striking Success:

6-Yr.-Old Sara Lee Rockets to $13 Million Gross

Top rung is won by mass marketing premium baked goods—processed by special equipment, constantly Q.C.'d, carried by new packages in far-ranging distribution, and backed by smart ad programs

COMPARED to the striking way that this specific business "just growed," Topsy was a piker!

Off from scratch in 1951, The Kitchens of Sara Lee, Inc., Chicago, ran first-year cake sales to $400,000 —then doubled and re-doubled them over the years to top $10 million in '56 and then hit a smacking $13 million in '57!

Watching this venture get under way, others in the cake business likened it to a tiny terrier nipping at the heels of this field's powerful bulls.

Would the terrier get trampled? It didn't. For it's become the nation's largest baker of quality cakes.

Founder Charles W. Lubin started with little more than an idea—"to bake a cake no housewife could duplicate for the same price, and to make it available close to her home." Lubin also had a thorough knowledge of baking, but limited capital ($15,000).

He's been up to his elbows in cake batter since first mixing dough and scraping pans as a 14-yr.-old apprentice. He toyed with the scheme of making specialty baked goods for the mass market back in the early '40s. But at that time, his idea only brought laughs. Bakers claimed that consumers wouldn't buy such expensive products, no matter how fine the ingredients.

Nevertheless, Lubin experimented until he had recipes he felt had broad public appeal. Then he developed the special package format for preserving the product's freshness while providing consumer convenience.

In '51, he tried out his idea—and his cakes received immediate consumer approval. The 79c. price—far above the conventional in a field

FOCUS ON NEW BAKERY

Latest Sara Lee expansion move was the recent breaking of ground for a new $4,000,000, single-story bakery to provide 110,000 sq. ft. on Chicago's north side.

Scheduled for completion this year, it's designed along clean-cut, contemporary lines in a trapezoid shape, with RR siding and truck docks for nationwide distribution. Exterior will be of structural glass and aluminum, with curtain-wall construction providing for future expansion.

Sanitation will be stressed in the features of the 40,000-sq.ft. processing area, which will be sealed from outside heat, light, and dust. Filtered air-conditioning throughout the plant will eliminate impurities and maintain controlled temperature and humidity.

Fluorescent lighting in the process section will reproduce daylight conditions. Pastel ceramic tile walls and round-cornered tile floors will assure highest sanitation in the bakery area.

Special facilities will include: (1) A research center comprising an experimental bakery and greatly expanded Q.C. lab, (2) freezer area (10,000 sq.ft.) for —30F. quick freezing and 0F. freezer storage, (3) garage and truck-

It's 5th Expansion Since '51

where 29-39-49c. coffee cakes were standard—is consistently rung up without protest in food stores.

How It Grew

Now about company expansions: From its original limited distribution in the Chicago area, Sara Lee has grown to national coverage serving thousands of chain and independent food stores and supermarkets, also the finest hotels and restaurants.

The firm keeps 47 route-delivery trucks rolling just to meet demands in its Chicago area.

When first organized in '51, the bakery covered only 2,000 sq.ft. In '52, it quadrupled its space by taking over 8,000 sq.ft. in another Chicago location, and its gross rose to $1 million. In the next year, volume went up another $2 million as the company again outgrew its kitchen and moved to its present quarters (35,000 sq.ft.). The gross was $5 million the following year.

Then in '56, Sara Lee was acquired by Consolidated Foods Corp. Operations, however, continue as before, with no change in policy.

That same year, production capacity was more than doubled through the acquisition of an additional 40,000 sq.ft. plant in River Grove, Ill.

Underway today is the company's fifth expansion in its short six years —a brand new, modern facility that multiplies its processing capacity (see details in accompanying panel).

Key to the ever-increasing demand for Sara Lee products is their premium quality. Pivot to the entire operations is the exacting way quality control is carried out through every step—from receiving of raw materials to distributing and selling of the end-products.

As for development of recipes, take the chocolate cake: Before the final recipe was adopted, 87 formulas were tested over a 2-yr. period. Most recently introduced—after trying more than 100 formulas over 18 months—is a new product, Sara Lee brownies. It has won immediate consumer acceptance.

Over 80% of the product ingredients are dairy items. Lubin claims to use more 93-score butter (over 2,000,000 lb. annually) and pure cream cheese than any food manufacturer in the country. And further accounted are the high quantities of fresh eggs and milk.

Fine Dutch-processed chocolate is employed for the chocolate cake and brownies. Additional products made are the original cream cheese cake and the coffee and pound cakes.

Company executives feel there's a tremendous potential in their premium-quality approach, hence they're constantly experimenting with new products.

And as for perfection in such baking, Charles Lubin emphasizes that it isn't attained by accident. It's reached only by careful planning and consistent follow-through.

Of course, getting modern, well-equipped facilities and teams of skilled, high-caliber personnel has been vital. Much of the specialized equipment used was thought out and developed by the company's executive vice-president in charge of production, Jack Kollman.

The quality control lab is notable. It analyzes all ingredients before approving them for use. And it constantly checks batches.

Uniformity is stressed in all operations. It's achieved by specially built process units and insured by automatic controlling and checking of temperature and humidity.

Brief of Special Equipment

In the design of the company-built machines, more accent was placed on uniform-quality production than upon operating efficiency. The units comprise: (1) An egg-wash sprayer, (2) pecan nut-spreader, (3) automatic icer for creating a lace-like pattern on coffee cakes, (4) graham cracker and cream cheese depositor, (5) cream topper for cream cheese cakes, and (6) an icing machine for chocolate cakes.

These machines evenly deposit just the right amount of egg wash, nuts, icing, etc. The cheese cake machine —the only one of its kind—abolishes over- and under-weights and, by tamping, insures uniform texture of the graham cracker crumb crust. Further, a minimum of hand-spreading is required after icing of the chocolate cakes.

In addition, continuous mixers and the latest batter depositor (Oakes) are employed for chocolate and pound cakes.

service section (20,000 sq.ft.) for company's fleet delivering within the metropolitan area, (4) accommodations for the 400 employees (cafeteria, recreation area, locker rooms, and first aid), and (5) a hospitality area.

The plant will be open to the public, with groups invited to tour both bakery and research center. Guests will be received in a hostess room, where operations will be explained and samples served.

Doubled Capacity, Automatic Flow

This newest bakery will enable both doubling of capacity and further expansion as needed. It'll offer the necessary freezer capacity—without going to commercial facilities—and afford better control of frozen-product quality. It'll bring increased production efficiency with latest machines and techniques.

Since the items made are tender-texture specialty goods, most basic product preparation will still be done by hand. However, automation definitely comes into the picture.

Transport of ingredients to processing area and of baked goods from ovens to shipping will be mechanized in straight-line flow. Dry ingredients, such as flour and sugar, will be automatically unloaded, stored, and pneumatically conveyed to production. There they'll be electronically scaled with automatic selectivity, then sent on to specially designed mixers simulating hand methods. Following preparation, cakes will be conveyed to continuous ovens and automatically iced and packaged.

"WE'LL STREAMLINE the flow here," says V.-P. Jack Kollman (right), as he and President Lubin eagle-eye blue prints of new bakery. Layouts have been repeatedly gone over to make sure of every last detail.

The mixers assure more uniform control of batter temperature, specific gravity, and flow—all essential in making the high quality cakes. And the new depositor is a simple operating machine that minimizes batter distortion.

Why use 93-score butter? Lubin notes that bakers often favor use of the stronger-flavored lower-score butters. However, he prefers the sweeter and milder 93-score.

A case in point: Pound cakes, he found, were the most difficult to make consistently uniform. Trouble is that they fall and 'yellow-streak.' And this was traced to the amount and properties of butter employed. Only after much experimenting, with special efforts to get a butter that wouldn't alter its plasticity, was the desired cake uniformity attained.

Package Developments

Particularly notable in Lubin's pioneering moves has been the merchandising of the specialty baked goods in rigid foil containers. Working with Ekco Products (now Ekco-Alcoa Containers), Sara Lee initiated use of the foil pan with laminated pictorial cover to package cakes.

The cakes are deposited and baked right in the attractive pans in which they are sold. This simplifies operations and is a sanitary factor.

Cheese cakes initially went into oblong-shaped endfold containers. Then, for its coffee cakes, the company introduced a round, drawn foil container, with a laminated, transparent window cover. And this started a trend in the food industry.

Pictorial covers are now used on all products except coffee cake. A silicone-treated parchment liner tops the chocolate cake icing to prevent sticking.

The company is now working on a new package design. Object is to get a still-better-looking package.

Along with package development, the company also went about improving machine-closing operations. Starting out with hand- and foot-operated units, it progressed to semi-automatic machines, and finally adopted an automatic device that shuttle-feeds up to 110 containers per min.

Advances didn't end here. For considerable work was involved in selection of the right case liners and dividers to eliminate shifting of product and prevent damage in shipments and warehouse handling.

With consumer acceptance of these higher-priced items, says the Executive Vice-President Mandall Kaplan, storekeepers were assured a higher sales margin. As a result, the goods won preferred shelf positions.

Until '54, the fresh-cake distribution primarily centered in the Chicago region (150-mile radius). In the spring of that year, however, operations were expanded, with cakes subsequently trucked over a 350-mile area for following-morning deliveries. Daily store deliveries are most important to control cake freshness.

The company also operates its own fresh-cake routes in the Detroit and Indianapolis areas. In other cities, economical mass distribution and control is accomplished through franchised distributors who handle these goods exclusively. Sara Lee's distributor sales division trains and checks them on operations.

The company, in short, puts great stress upon its control of these selling operations. It alerts the distributors to proper merchandising techniques.

Freshness control is paramount. Items are distributed on a guarantee sales basis, and should any products outlast their code-life, the company will buy them back from the storekeeper.

Late in '53, frozen cakes were added. And the system required to distribute them was initiated in the fall of '54 through establishment of warehouse stocks in key metropolitan areas plus arrangement for sales.

Here, Sara Lee was a newcomer in a very tough, competitive, price-conscious field. It stuck, however, to its established merchandising standards. After all, shopper satisfaction was the key. And it swiftly secured a widespread distribution through winning consumer acceptance.

Ads Play Vital Part

Advertising has been important in stirring consumer appetite for the products. The ads are geared for heavy impact over relatively short periods in all media.

This effort is designed to reach

most consumers, it being figured that they'll repurchase once they've tried Sara Lee items.

Chicago was the center of the company's initial radio-TV activities. In '51, two video programs were sponsored ("Creative Cookery" and "Garfield Goose"). Then there was expansion into other cities.

Personalities were signed up on established shows. There were short-term radio-TV announcements. And a test TV drive was made in select eastern markets. Blanketed were such cities as Boston, Buffalo, Atlanta, Louisville, and Detroit. Also added were chainbreaks in ten key markets tied into Walt Disney's TV "Mickey Mouse Club."

Then, with some 75% of the major markets covered, Sara Lee hit New York City and the adjacent areas. This was in Sept. '56.

In New York, it followed through with a concentrated ad campaign. When the agency came up with a proposal, Lubin doubled it. Full-page ads were taken in 24 papers four different times between February and June of '56, plus saturation radio-TV spots.

Further, there was a follow-through at the local-store level—mailing of brochures of the spot ads and newspaper insertions to over 20,000 stores.

Next came similar multi-product drives through 50 radio and 50 TV announcements running in Washington, Philadelphia, and Baltimore.

Sara Lee continued to do a task-force job in other markets. It's sponsored a 15-min. segment of the Arthur Godfrey radio program on the entire CBS system, also the Tex & Jinx daytime show on the NBC TV network.

The impact-advertising is carried out on an individual market basis. Take a recent Chicago campaign, for example: A full-page color ad in the *Tribune* along with a black and white page in the *Daily News*. This was run in conjunction with use of 387 outdoor billboards throughout the city, in addition to the three 'spectacular' billboards the company regularly employs. Then there were 143 radio and TV spots.

The company found there was no substitute for in-store merchandising of frozen cakes to solve out-of-stock problems and to secure sufficient display space consistent with sales potential.

Accordingly, a frozen-food supervisory staff travels from market-to-market to assure maximum sales effort.—*FE Staff.*

TECHNOLOGISTS: What's Wanted Of Them—And What They Want

WHAT DO MANAGEMENT and the consumer expect of a food technologist? And what does the technologist expect of management?

These questions recently were discussed in a symposium at the Chicago section, Institute of Food Technologists.

W. U. Hudson, vice-president, Gerber Products Co., Oakland, Calif., observed that management expects technical groups to cooperate with other departments—sales, production, accounting, and finance. And such cooperation involves human relations, communications, and compromise.

It requires a willingness to: (1) Listen with an open mind; (2) seek advice and counsel; (3) keep people within the department informed of what's going on; (4) give credit where due, and (5) debate controversial subjects, then accept and support the final conclusions.

Management looks for imagination and creative ability, and would like the technologist to be skilled in selling his ideas. It wants him to prepare for bigger jobs, for it is difficult to find people willing to accept responsibility.

Management is concerned with internal administration of the research department and its relation to the company. The old theory that quality of research is all that counts, and that the cost of a good idea is immeasurable, can't be supported in this period of heavy research expenditures.

Research should base its recommendations on *broad* company prospects. A new product or technical development should be presented as a complete "package". This should include consumer and market surveys, production flowsheets, plans for engineered equipment, purchase "specs", economic studies, and detailed analyses of advantages and disadvantages.

What Technologist Expects

Roy E. Morse, Professor of Food Technology, Rutgers U., pointed out that the technologist desires more progressive management, with a better attitude toward responsibilities and activities of the research and development group. And technical men want to be considered for responsible management jobs.

The research and development department wants more emphasis on new products. It wishes to undertake more basic food-product research which is, to a large measure, now carried out by colleges and suppliers.

For himself, the technologist expects an understanding attitude on the part of management. Basically, he is dissatisfied with what's going on—for he's always thinking of a better way of manufacturing a product or improving its quality. Further, he wants to be proud of his facilities.

Should Know Consumers

The food technologist must come out of the laboratory to get first-hand information about the consumer, emphasized Elaine C. Norden, director, Consumer Dept., Campbell-Mithum Advertising, Inc., Chicago. He should know who the consumer is, understand her food standards, learn how she entertains and where she buys.

The consumer expects the technologist to insist on packages that properly contain and protect products. She feels he should work closely with advertising and display departments so that packages will easily and quickly inform her about the products. She expects him to have the backbone and integrity to maintain technical standards.

The technologist, sales department, and marketing people need each other, observed George Anderson of Dudley, Anderson & Yutzy. Working together, they can learn the consumers wants and develop or improve products to win her acceptance and step up sales.

How can the technologist find out what the consumer wants? First of all he must be aware of the current specialized markets, each with its own interests and requirements. What will satisfy the teen-age market, for example, will be of little interest to senior citizens.

Mr. Anderson challenged the technologist to take a trip every six months with a company salesman. He also suggested visits to supermarkets for talks with managers and housewives to get first-hand information on who's buying what and why.

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- How to avoid perceptible changes in flavor—mixtures—solubility—temperature and pressure.
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- Factors to consider in choosing a gas.
- Things to remember in storing and handling gases.
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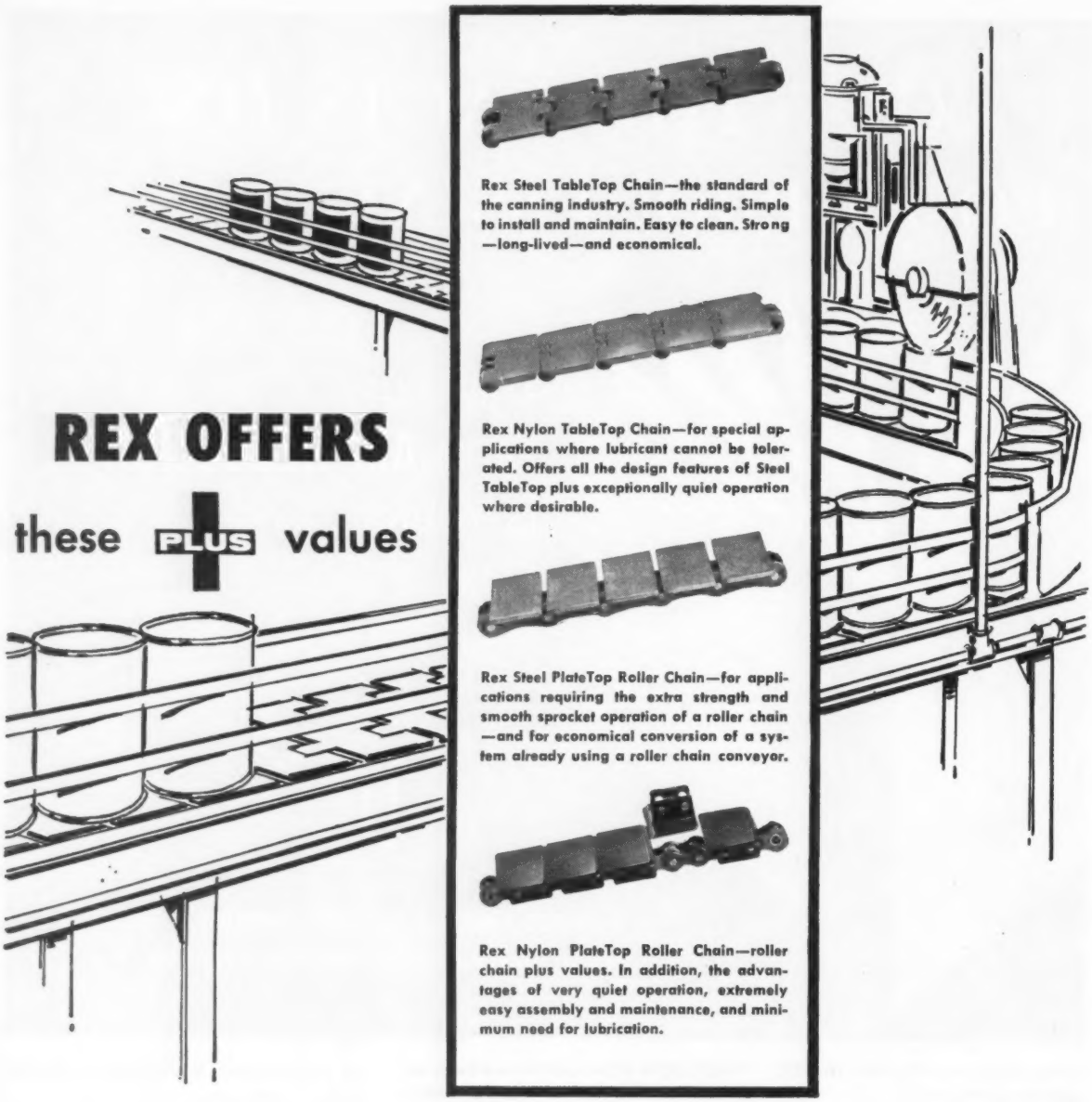

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CHAIN BELT

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Ole Sage Episode

"I say 'thumbs down,' " growled Batt. "It's just money wasted — giving your workers a good time, but still not telling 'em!"

What's *Good Copy* for the 'Company Mag'?

"I WANT to take notes on this meeting," announced Luke Markham, flourishing pencil and pad. "You see, we're overhauling our communications at Colossal Candy, and we're seriously considering putting out an employee magazine—on a trial basis, of course. So," he pleaded, "let's have all the tips slow and easy."

"Yes, we planned to talk about what to put in such publications," said Barney Hasbrook. "Come on, then, Ole. Tell us all the subjects these sheets can print—naming the ones you think are most valuable."

Before answering, Ole Sage thumbed through his notebook. "News about employees," he began, "is the No. 1 attention-getter. For that reason it's a regular in all of them. Often this news appears under a number of separate heads—Births, Weddings, New Employees, Promotions. Such copy is always 'live.'

"And since most of us like to see ourselves in print, Inquiring Reporter columns are also frequent. Other favorites are The 25-Year Club, and similar features, since they give older workers a pat on the back, recognizing their years of service. Further, the 'retired old-timers' type of department, which brings news of absent friends, is also popular. And here are still others: Employees in Service, Company Sport Activities, Doings of Our Employee Clubs.

"What's more, there's such other copy as tips on safety, suggestion systems, women and their interests, children, hobbies, questions & answers, and letters to the editor."

At this point, Mull & Mull Co.'s Batt Bulwark broke in. "I say 'thumbs down' on all of it," he growled. "It's just money wasted—giving your workers a good time, but still not *telling 'em!*"

Ole ignored the interruption. "A growing number of employee publications," he went on, "cover many additional subjects. I'm referring to those in which management does its best to inform workers on the company's policies and actions. In these, the managements don't hesitate to discuss organization economics. Even controversial subjects—which many organizations still consider 'hush-hush'—are gone into."

He flipped a page to a pasted clipping. "Here's a specific example—a U.S.C. of C. listing of such subjects as covered in just one company's publication." He read: " 'Plans and progress of company advertising, state of the business, plant and community campaigns, competition, credit union activities, fringe benefits, industry news, changes and clarification of insurance, reasons for layoffs, cost of maintenance, reports on sales meetings, method improvements, pensions, news of company products, public relations, the company's annual report, and union-company agreements and bargaining.' "

Luke was now waving his hand.

IVAN C. MILLER
"Food Engineering"

"If we don't want workers' attitudes to be based on bias, it's up to us to give them the facts."

"S-l-o-w down," he begged. I can't write 'em down that fast."

"Oh, don't bother taking notes, Luke," cracked Batt. "You'll save your own time—and your company's money, too—if you don't!" His tone indicated he was ruffled. For thus far he'd been preempted in his self-appointed role as spearheader of the discussion.

"But why the cold water, Batt?" asked Luke.

"Because I've got *proof* these things are a waste," came back Batt triumphantly. "And I'll produce it. Now when it comes to *telling 'em*—and you fellows only make it complicated calling it 'Communications'—you'll have to admit telling 'em in a magazine costs the most. And where does it get you?"

He paused for effect, then barked, "This time, Ole's not the only one with notebook ammunition." He lifted a copy of the AMA magazine, *Personnel*, and opened it. "Just listen to this," he said, and began reading—

No other area of management has ever come in for so much abuse as the employee publication. By the giving of goals and of words, it is assumed the goals are achieved by the words.

Americans read to be entertained. When entertainment ceases they refuse to read. A corporation's high-minded ideals and long-range goals are simply not entertaining to many workers. So far as the company is concerned, their interest centers in their paychecks, their fellow workers, and whether the company can be expected to stay in business for a foreseeable future.

The role of civil leader, champion of management, extoller of private enterprise, or family counselor is outside the realm of the employee publication. All it is and all it can ever be is a cohesive force whose function is to weld the company into one semblance of a unit. To assume that this end-result must be a company of right-thinking workers is no more warranted than the assumption that all members of the same family must necessarily hold the same views.

The American worker is the most preached-to man in the world. If someone isn't after his paycheck, it's his soul, and if it isn't his soul, it's his spare time or his way of thinking. When management steps into this field by assuming that it can encourage right thinking, it is becoming a propagandist. By extolling a particular way of looking at the company's activities, management insinuates that the company is right. Any employee can tell management a hundred things that are wrong about the company, and if given the opportunity he will.

Batt paused and smugly looked around the table. Then he blasted: "That's it in a nutshell—employee magazines are a waste! If the workers won't listen to you in them, then you can't *tell 'em*. And if the papers are only good for entertainment, I say cut 'em out and split the money you woulda put in 'em 50-50—half to the workers' paychecks and half to the company toward profits."

"Why so generous?" queried Milt Sorenson. "How come you're willing to go 50-50? Why not *all* to the company?"

"'Cause I might be counted as an employee," chuckled Batt.

Luke interrupted the cross-play. "Ole, I'd like to hear your views on what Batt's just read."

Ole nodded. "Well, in a recent address, GE's William Scholz stated my views better than I can." He pulled several printed pages from his notebook. "So now I'd like to do some reading myself. Here are his views and *mine*," and he read—

One need only glance at a typical company publication with its columns of personals and studious avoidance of facts about the business, let alone controversial issues, to have grave misgivings as to the value of the medium as it is presently being used.

Yet, ineffectual as they often are, employee newspapers or magazines are published by practically all large companies and most middle-size and small organizations, too. As a matter of fact, the enormous sum spent annually by American industry on these publications—well over $100,000,000—constitutes probably the largest single expense item in the whole range of employee-relations activities. Further, according to Opinion Research Corp., most of the companies that have employee publications consider them their major channels for getting information to employees. These 'least-expensive-forms-of-mass-communications' comprise the only medium for regularly reaching wives and families, as well as the employees themselves. It has been estimated that they make their way into almost every American home.

Obviously, these publications are so closely interwoven with the entire fabric of employee communication that we cannot seriously consider abandoning them. Quite apart from their already deeply entrenched position as the backbone of employee communication and their as yet unrealized enormous potential as molders of opinion, the fact of the matter is that there is no adequate alternative to them.

Employees are in the process of forming opinions every day—about management, about their companies, about the major national issues under debate. If we don't want their attitudes to be based on hearsay, on bias, propaganda, or the grapevine, it is up to us to give them the facts from which informed opinion can be drawn.

As Ole re-folded the pages, Zenith's Si Worth spoke up: "Them's strong words, Ole. And they raise a lot more questions."

"I've got more questions, too, Si," said Luke. "But let's have some of yours first."

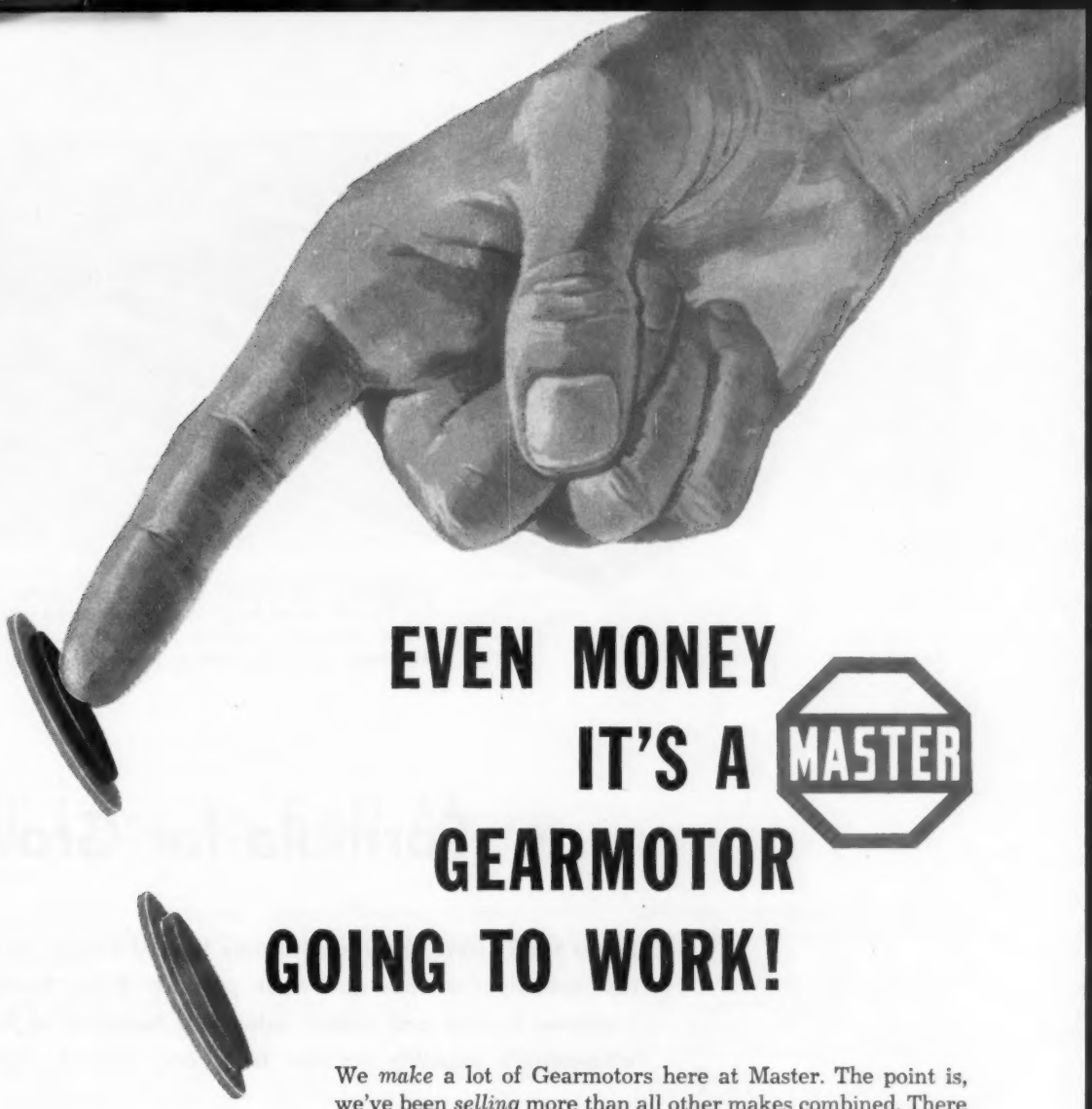
"Okay," said Si, "here goes: We're told to lay it on the line in these sheets. But just *why* is that course so advisable? Furthermore, just *what* subjects or areas do you cover when you go so far out on the limb—and where do you find these sound facts—facts that are safe?"

"Just what do you mean by 'sound and safe'?" Batt bellowed sarcastically. "A fact is a fact. That ought to be safe enough for anyone. And . . . but look at that clock! We'll have to hold up on these special breeds of facts until our next luncheon." —*End*

UP THE HARD WAY came Ole, our principal character in this special series of "cases" fictionized to pinpoint boss-worker problems in the food plant.

Ole began as a laborer, proved himself "a good worker" who "used his head"—thus won the respect of both workers and bosses. He later rose to foreman, then superintendent. And finally he was management's choice as "a natural" to head Industrial Relations, a job he carried out with unusual success until his retirement.

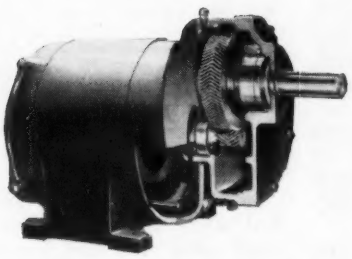
—Actually, his was a short retirement: His old company, others, too, quickly called on him for counsel, and his know-how was always "on tap" for the working Guff & Gripers—as related in these episodes.—*The Editor.*



EVEN MONEY IT'S A MASTER GEARMOTOR GOING TO WORK!

We *make* a lot of Gearmotors here at Master. The point is, we've been *selling* more than all other makes combined. There are more Master Gearmotors in *use* than all others. Users *buy* more. And you don't find any foolish motor buyers—or not for long.

So it's obvious that Master Gearmotors simply must meet most requirements best. If you're not a Master Gearmotor user, now's the time to find out what you're missing!



Master Gearmotors are available with all Master motor types in right angle and parallel construction.

IT'S TIME YOUR DRIVE REQUIREMENT MEETS ITS MASTER

With five types of parallel and right angle Gearmotors, Master has the flexibility and choice of design you need.

With electric motor and gears combined into a compact, integral power unit, you reduce costs and increase efficiency through elimination of belts, couplings, chains, sprockets, external bearings or separate reducers.

They are available in sizes from ⅛ to 125 H.P. You can integrate with the gearmotor: electric brakes, 3 types of variable speed units and fluid drive in any combination.

THE MASTER ELECTRIC COMPANY • Dayton 1, Ohio

DIVISION OF RELIANCE ELECTRIC AND ENGINEERING CO.

SPECIALLY DEVELOPED packages help protect product quality. Tasty-Pie carton has perforations along sides for air circulation around 'hammock' (vegetable parchment wrap) inside box. Air flow keeps crust crisp, reduces possibility of moisture pockets.

Formula for Growth:

Baker stocks store shelves with only limited supply, thus makes sure consumer always gets fresh product. Policy builds strong customer loyalty and repeat sales . . . Network of franchised wholesalers expands volume from one city to eight states

WHILE the hard-sell vs. soft-sell debate goes on, a Quaker City baker is reaping dividends with his own version. "'Sell' less to sell more" is the marketing philosophy of Tasty Baking, Philadelphia—and it's paid off with strong consumer loyalty, firm sales growth.

Unlike most manufacturers, who seek maximum shelf space for their products, Tasty Baking is content with just enough display area for a limited supply of its individual-serving size cakes and pies. Its reasoning: By strengthening your reputation for first-rate quality by forestalling possibility of consumer buying a stale product, you curb costs by eliminating stale-returns.

This selling strategy is credited for the 28% increase in sales since '53. Which is no mean feat in today's very competitive baked goods field.

THAYER C. TAYLOR
Associate Editor, "Food Engineering"

Controlled distribution is what President Paul R. Kaiser calls it.

"We control sales to insure product freshness," he explains. "Since our salesmen visit independent food outlets at least three times a week, and most supers every day, amount of goods stocked on shelves is carefully calculated to last until the next visit. By controlling stocking, we eliminate returns—because the products are sold out just before the salesman's next visit.

"The salesman sells fewer units (company makes 10 cake varieties, six pie items) than stores would like stocked. But in the final analysis, he sells more, because the assurance of product freshness builds repeat sales."

Tasty's credo dates back to company's founding period, when Herbert C. Morris and Philip J. Baur, co-founders, decided to aim for elimination of stale-returns by instructing salesmen to deliver just enough for a few days.

Tasty's sales policy has generated striking consumer support in the Philadelphia area. Just how strong it is can be seen from a survey of 1,181 housewives by the A. J. Wood Co. research firm in '53.

Findings showed: (1) 80% of the women bought small cakes and pies on a regular basis; (2) Tastykake and Tasty-Pie dominated the area, with 87% of the buyers purchasing them regularly; (3) 95% picked Tastykake first when asked name brands of small cakes. The next leading cake was selected by 24% (women allowed multiple choice).

The controlled distribution receives strong support from the company's other marketing phases, namely—

1. Sound sales training program designed to get maximum output per salesman.

2. Aggressive promotions to keep brand name before consumers, build pre-sell demand.

NEAT DISPLAYS appeal to consumers, induce them to buy more. Impulse sales are sparked by Tasty's die-cut cartons, which act as their own shelf-display units.

MARKET RESEARCH precedes promotion campaigns. Studying map of company's sales area are (l. to r.): John Maloney, assistant advertising manager; Daniel Gorman, market research assistant; and C. H. Vidinghoff, advertising and market research manager.

'Sell' Less to Sell More

3. Merchandise-wise packaging geared to protect product quality, spark impulse sales.

4. Strictly controlled sales franchises to open new territories.

Salesmen are handpicked for their job. Because Tasty pays drivers above the union scale, it is able to pick and choose from a waiting list of 200 applicants.

A new salesman undergoes a six-week training period before he is given a route. After he's put on a truck, his training continues for from six months to a year.

Policy is to have the salesmen devote their time exclusively to selling and building customer relations. To maintain the quality connotation it builds around its products, the company requires field men to wear clean, fresh-pressed uniform at all times.

If a vehicle breaks down, the salesman can't make repairs or change a tire on his own. Instead, he must call the transportation department, or if he's too far out for help, ask a local garage to do the work.

Smart Promotion Helps

Backing up the man-on-the-route is a strong merchandising program. Tasty has hiked advertising expenditures 40% since '54, spent close to $500,000 last year carrying its story to the public.

Media used include leading dailies (in eight states), radio, TV, and billboards. The company has co-sponsored all televised games of the Phillies ball club since '54. And last year it built TV commercials around Shari Lewis, popular puppeteer-ventriloquist.

So effective is this merchandising that the company has successfully resisted demands for promotional allowances—an unusual feat in today's food marketing. True, the policy has kept Tasty out of the biggest chain in at least one metropolitan area—but the firm has stuck to its guns, strongly feels that promotion is best carried out by the manufacturer.

Packaging plays a key role in the marketing program. Family identity is carried out by the distinctive blue-lettered "Tastykake" and "Tasty-Pie" trademark on all packages. Cake boxes, containing glassine-wrapped product, are made from misty blue-gray board and are die-cut for easier store display.

Rectangular-shaped pies, introduced in the '30's, appear in two-color cello-wrapped specially designed packages. Container is a patented, hammock-like unit having perforations to permit air circulation.

These apertures help keep the crust crisp and eliminate the collection of moist air. The grease-proof pie box (Container Corp. of America) has a cellophane strip which seals the box at both ends.

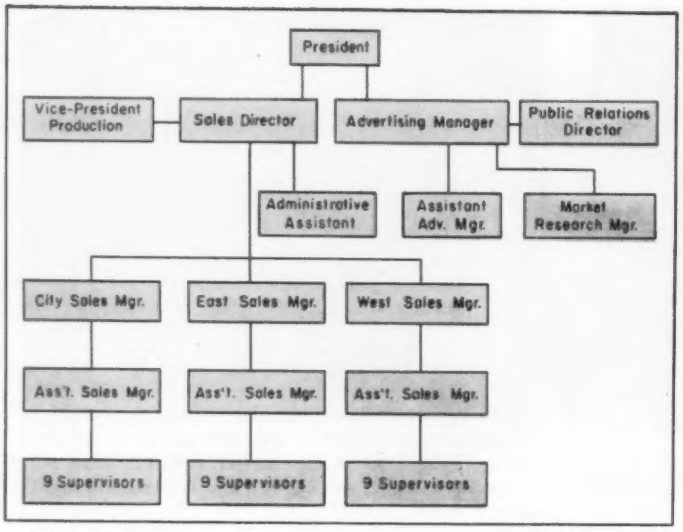
Each fruit pie is identified with an individual color and illustration of the fruit.

Licensed Wholesalers Setup

To expand sales beyond the Philadelphia area, Tasty worked out franchise arrangements with bakeries having established routes for non-competitive products. Prospective distributors must meet two standards—financial stability and community reputation for quality merchandise.

Franchises are granted only after long investigation. And they're withdrawn if Tasty's requirements for product freshness, business integrity, and sales policies aren't maintained. In fact, such cancelling has occurred on several occasions.

Franchise distributors buy products at the same price, as do retail outlets—about 19% off the selling tag. Although the company has a



FINAL DECISION on sales policy is made by president. Reporting to him are sales director, who handles men in field, and advertising manager, who heads promotion and market research in conjunction with Public Relations Director R. Barclay Knight. (Chart conceived by FE.)

12¢ policy on all products, some distributors retail the items for as much as 15¢.

Mainspring in the company's marketing program is husky, 6 ft. 4 in. President Kaiser. He left a successful career in insurance to take the company reins in '53.

Embarking on a long-range program to trim costs and expand sales, Kaiser has—

1. Streamlined production with an equipment modernization program.

Company has invested $2.5 million in automated equipment since '53, plans to spend $2 million more by '60. With all of this coming out of earnings, company is avoiding borrowing.

Recent additions include spiral chutes to speed cartons from packing department to shipping, powered conveyors for smoother flow of materials, improved facilities for handling raw materials in the receiving department, and specially designed ovens for product research.

Significantly, automated equipment has slashed baking cycle of cakes in some cases from 12 hr. to as little as 45 min.

Packaging has come in for its share of modernization. Already, $80,000 has been spent in developing a wrapping machine that will do the job automatically on sponge cakes, eliminating present hand-wrapping. Automatic equipment for filling and handling cream cakes has also been perfected.

2. Pushed sales to outlying areas.

With the Philadelphia area pretty well saturated (99% of chains and independents handle Tastykake, 95% Tasty-Pie) Kaiser bet on sales franchises as the best way to boost sales through territorial expansion.

Putting the company's routemen to work in outlying, and sometimes thinly populated areas was considered unprofitable, so he set about building a network of franchise distributors. Company's products are now sold in at least 30,000 outlets in eight states—Pa., N. J., Dela., N. Y., Conn., R. I., Va., and Md.—as well as the District of Columbia.

More new areas will be opened. However, company will proceed cautiously, with guiding policy to deliver only to those areas where consumer will eat the product within 24 hr after it comes from Tasty's ovens.

Possibilities of expanding sales through vending units are being studied. One distributor recently tried this idea successfully, and company is surveying other areas for possible use. Here, too, safeguards will be set up to make sure product is bought the same day it is placed in the vender.

As president, Kaiser makes final decision on marketing policies. Heading up daily sales activities is Frederick R. Pierce, sales director, who has one administrative assistant and three sales managers reporting to him.

Tasty Baking's sales perimeter is divided into three areas—the city (25-mi. radius from plant) and, further out, the east area and the west area. Each division has its own sales manager (reporting to Pierce), assistant manager, and nine supervisors (each with seven to ten salesmen).

Responsibilities are divided according to geographical area and nature of sales problems involved. All major problems are handed up to Pierce for decision, and if company policy is involved, Kaiser gives the final word.

Advertising and market research is under C. H. Vidinghoff. He carries out the market research that precedes moves into new territories or launching of new advertising campaigns, and then coordinates his activities with Pierce's sales promotion work. Market research is delegated to the advertising department, leaving the sales director free to devote all his time to selling.

New product development and the quality control laboratory. All prospective new products are subject to Kaiser's approval.

Labor Costs Almost Triple

Like most bakers, Tasty has been hit hard by increased costs. Since '50, labor fringe benefits have jumped from $600,000 to $1.7 million, (vacation pay from $134,000 to $300,000), medical insurance from nothing to $85,000, work clothes from $45,000 to $75,000, and pensions from $10,000 to $300,000.

Automatic equipment has helped defray increased costs, but last year the concern was forced to up the price of its individual cakes and pies from 10¢ to 12¢.

Sales dropped noticeably at first, but part of the loss has been recouped through stepped-up promotions. Although competitors initially refused to match the increase, some of them recently followed suit.

To win back those customers who refused to pay 12c, the firm has just introduced its Creamees item at 10¢. Lower price is made possible through new automated equipment and slightly smaller product size.

From Packaging Lines Into Warehouse

OVERHEAD CONVEYOR brings cased goods to rotating sorting table, where as many as ten men select cartons and load them on pallets. Lift-truck hauls loads to assigned storage areas to await shipment.

REPEAT HANDLING is avoided by storing part-pallet loads on these triple-tiered racks away from main storage area. This efficient technique also greatly simplifies and speeds order-picking.

Punch-Card System Speeds Case Handling, Cuts Costs

Pillsbury's new warehouse combines electronic data processing with integrated case sorting to take the bugs out of order assembling. Simplified routine whisks cased goods from packaging to storage and docks, keeps handling costs down

EFFECTIVE distribution service pivots around how fast you get ordered goods out of your warehouse and on their way to wholesaler or retailer. For the quicker your merchandise moves, the sooner it starts building sales.

Pillsbury Mills' new Springfield, Ill., warehouse now neatly pairs integrated case sorting with electronic data processing—thus minimizing the time span between packaging of products and loading onto cars or trucks. What's more, the plant's simplified storage and order assembling system keeps handling costs down.

By combining efficient materials handling of cased goods with punched card reports, Pillsbury has benefited from: (1) Improved customer service, (2) better inventory control, (3) lower handling costs, (4) advance production scheduling, and (5) proper stock rotation.

Operating on an around-the-clock schedule, the warehouse supplements eight other Pillsbury units at Springfield. It's an 80,000 sq. ft. layout—with 45,000 sq. ft. for storage, 35,000 sq. ft. for loading.

More Sorting Flexibility

Integrated handling begins as soon as finished products come off the packaging lines. Cased goods—prepared cake mixes and similar grocery items—discharge from packaging machines and move along three conveyor belts alternately feeding cartons to a single conveyor line. This line carries the cartons to a rotating case-sorting table (26-ft. dia.).

Turning at a speed of 1 to 3 rpm., table is conical-shaped to permit cases to slide down to a reverse-tapered lip (2 ft.). Handlers—each assigned to 2 or 3 products—sort 48 to 168 cases onto pallets.

The system gives Pillsbury flexibility, since combinations of different products can be sorted by each handler. Also, a wide variety of products (around 50) as well as different case sizes and weights can be sorted in one spot.

From the sorting table, pallet loads are lift-trucked to assigned bays and stacked three high. Number and pallet depth of each bay is painted in white and yellow on the floor in front for simplified inventory control.

To avoid costs of repeated handlings, Pillsbury keeps part-pallet loads out of the main storage area, spots them in a special area along the south and west walls. Here, mixed loads are put on triple-tiered racks that hold about 300 pallets.

Shipping delays are abolished by

night-time assembling of orders in an area adjacent to loading dock. In the morning, orders are lift-trucked to RR cars or over-road trailers.

Up to 60 cars (18 to 20 with grocery items) are loaded daily. Each car contains 20 to 30 pallet loads (48 to 168 cases to a pallet).

Loading area is enclosed, thus protecting both personnel and goods against inclement weather, which could slow up operations. Included in the area are five spur tracks, each holding six cars, and docks for 20 trucks.

Loading docks on both sides of the RR tracks are flush with car doors to eliminate dock boards. Box cars can be loaded without having handlers go through one car to get to another one. This means much faster loading.

12 Steps to Better Handling

To keep production and shipping flowing smoothly in all nine warehouses, Pillsbury worked out this 12-step punch-card routine:

Step 1: A batch of 'mark-sense' cards, summarizing specific warehouse, bay location, number of pallets, production week, and production code number, is relayed from tabulating to shipping department. Each morning at 5 A.M., five men (with a card for each bay) count pallet loads of stock available and mark-sense the cards. By 7 A.M., cards relayed to shipping department, along with additional ones covering product in car at time of count, are passed on to tabulating.

Step 2: Cards go through an IBM sorter that separates punched from new unpunched ones and also counts them.

Step 3. All cards are then run through the reproducing mark-sense machine that code-punches warehouse, product, bay, production week, pallets, and cases per pallet. At this time, pre-shipped loading and hold (product not shipped out) are key punched by product code and quantity.

Step 4: The two decks (mark sense and hold cards) are machine-sorted by product number.

Step 5: Both decks are then fed through the collating machine along with a master card covering as many as 1,200 different products. Master card includes data on product, size of package, size of pallet, cases per pallet, etc.

Step 6: Gang punched from master card onto both decks are product code, age, amount of pallets, etc.

Step 7: Both decks are again fed through master-sense machine. Master card is filed, and hold cards are run through sorter, to be subsequently held until mark-sense cards are multiplied.

Step 8: Mark-sense cards are processed by the calculating machine, where total number of cases per bay are figured from number of pallets and cases per pallet. The total is punched onto cards.

Step 9: Hold and mark-sense cards are merged, along with a third deck of shipping cards, in a collating machine to give inventory on hand.

Step 10: Rejected cases pulled out of stock are made up on a separate report.

Step 11: Hold, shipping, and mark-sense cards are run through the sorting machine that separates them by stock status code into five decks for as many production sections (flour, bakery mix, hotel and restaurant mix, specialty, and feed.).

Step 12: Reports from five decks are listed by tabulating machine onto a stock status report (a summary of information from all cards) for production, shipping, and accounting departments.

Know What Is Needed

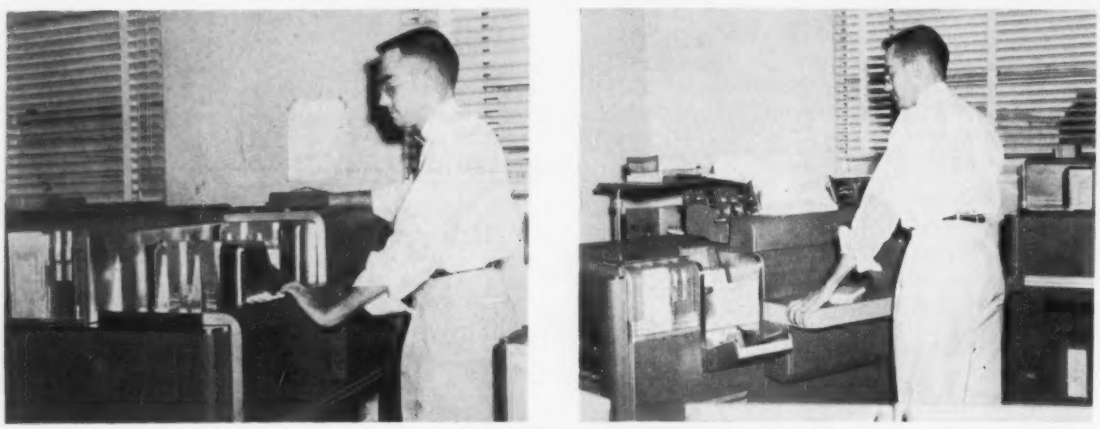
With this report, production men figure out what's on hand and to be manufactured. Shipping is able to simplify and speed the taking of inventory by locating and determining amount of stock in bays and figure out shipments. And the accounting department uses it for inventory control.

By 9:30 A.M., tabulating machines have handled about 2,500 cards, and reports are then available for the three departments. This way, production is advanced. And shipping is provided with a list of empty bays. Latter information is sorted out from mark-sense cards at Step 4, and then fed through tabulator that lists empty bays by warehouse.

From daily stock status report, shipping assigns product from bays for each item on a loading-order.

With this information on hand, production lines can be scheduled according to orders. —*FE Staff.*

Inventory Control Keyed by 'Mechanical Brains'



PUNCHED CARDS keep shipping and production departments informed of what's on hand and what's needed. Left: Data is punched by 'mark-sense' unit. Right: Complete card data is tabulated onto five daily stock status reports. These are relayed by 9:30 A. M. to two departments.

New! A unique system for avoiding production delays

Just recently, Clark Equipment Company inaugurated a communications system among dealers, its parts supply division, and its four plants, using electronic data processing and transmission equipment. Thus, when you need a specific truck or part that is not available locally, you obtain a fast answer through Clark headquarters and the entire dealer network.

All requests are put through data processing equipment for immediate action. Headquarters communicates with dealers individually, regionally, or nationally for information that will give you an answer in minutes. The system provides service unparalleled in the materials handling industry.

For details of this modern, new communications network and how it will affect your operations, simply write: Network, Clark Equipment Co., Battle Creek, Michigan.

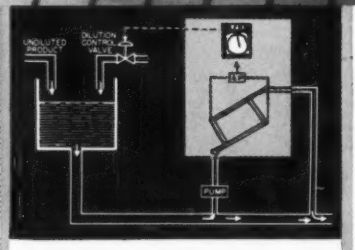
CLARK® EQUIPMENT

ted in U. S. A.

NOW... automatic, continuous CONSISTENCY CONTROL

You no longer need depend on the "calibrated eyeball" approach to consistency measurement . . . because the new F & P PLASTOMETER measures, records, and controls the consistency of fibrous and pulpy slurries . . . *continuously, automatically!* Apple sauce, tomato products, cream style corn, baby foods, and similar products can now be held well within the tolerances of desired consistency.

Consistency is far too important to be jeopardized by random calibrating methods. So take the first step toward continuous, automatic consistency control by writing or calling a F & P Field Engineer. Fischer & Porter Company, 3328 County Line Road, Hatboro, Pa. In Canada, write Fischer & Porter (Canada) Ltd., 2700 Jane St., Toronto, Ontario.



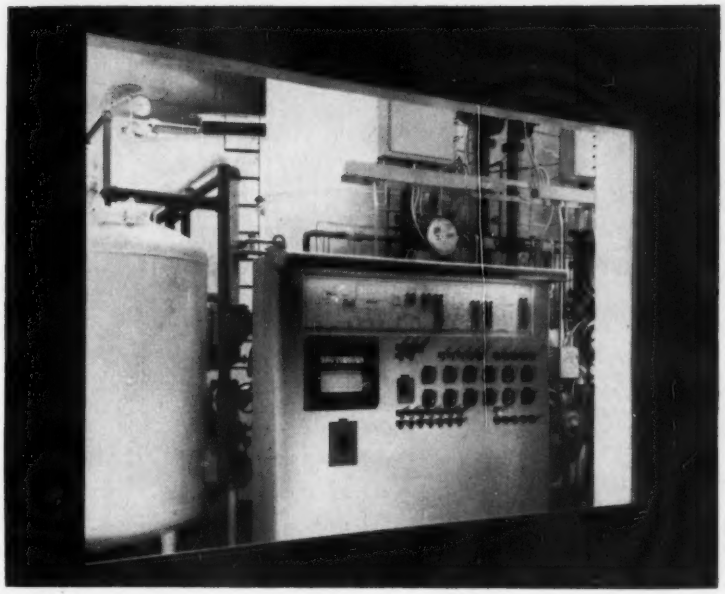
The Plastometer makes use of a simple flow bridge to produce a pressure differential between two reference points. This differential pressure is a direct function of the concentration of insoluble solids in the slurry, and is independent of the viscosity of the liquid phase of the slurry. In the typical installation above, a recording controller is used to throttle a dilution valve as a means of maintaining desired consistency.

FISCHER & PORTER CO.

Complete Process Instrumentation

Ion-Free Beer Boosts Sales

By merchandising its water-purifying deionization system, Midwest brewer climbs high on marketing ladder



AUTOMATED control panel keeps tab on flow and regeneration of the 9,000 gph. deionization system. Controls in company's smaller system are manually operated.

EVER CONSIDER using an innovation in your production process as a marketing tool?

This is a pertinent idea, since there may be a phase of your processing which, when properly merchandised, will go far toward convincing consumers that your product has that extra something they're looking for.

When, last March, Goebel Brewing, Detroit, became the first brewery to install a complete Monobed, or mixed-bed, deionization unit for water purification, the company's sales were sagging. However, Advertising Manager John P. Rudden astutely saw in the deionization unit a promotion potential with a punch that was different.

As soon as the system (supplied by Illinois Water Treatment, Rockford, Ill.) went on stream, Rudden was ready with the trademarked word "Crystilled" for the water. He followed this up by getting the Sons of the Pioneers to paraphrase their familiar musical recording *Cool Waters* in numerous Michigan-area TV and radio spot commercials.

Low conductivity of "Crystilled" water is stressed in demonstrations on the video commercials. Announcer is seen lighting a bulb by passing current through ordinary tap water—whereas the bulb doesn't work when the rig is applied to a glass of Goebel's purified water.

The results: Sales zoomed, and Goebel climbed to neck-and-neck contention with Pfeiffer Brewing, Detroit, for second rung on the Michigan sales ladder. President Edwin J. Anderson gives the "Crystilled" promotion 80% of the credit for this growth.

Thus encouraged, this brewer is now considering moves into other fields for plus-sales. Plans for selling "Crystilled" water as such are in the works. A few select Detroit bistros have tried and approved it in sample quantities as a table and mix water.

One big advantage Goebel will have if it moves in this direction is a peculiar Michigan law that prohibits illuminated signs advertising alcoholic beverages *inside* the place of sale.

This has led to some unusual touches in the brewery field. The company's arch rival, Stroh Brewery, Detroit, conveniently conducts a sideline ice cream business. Signs plugging this product appear in the most unlikely places, always with a very large "Stroh" and a very small "ice cream."

Goebel is designing neon units proclaiming "Goebel's Crystilled"—with a very small added "water."

Because of the advertising factor, Goebel has had a "gentleman's agreement" with Illinois Water Treatment that restricts the latter from promoting the sale of deionization equipment to any other brewer before March '58, and in Goebel's marketing area until March '59. However, competing brewers can purchase similar equipment from other suppliers.

The brewer hopes that others will be deterred by the complexities of "resalting" the overly pure water to the brewmaster's taste. Company has patents pending on this phase, hoping to control use of deionization in the brewing field.

Extra costs involved in brewing "Crystilled" beer haven't been determined yet. But based on experience in other fields—sugar refiners, soft drink bottlers, and whiskey distillers, for example—deionization can run anywhere from 15 to 40¢ per 1,000-gal. of water. Cost per barrel, therefore, should be negligible.

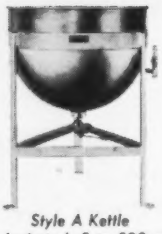
As installed at Goebel's, the system consists essentially of a coagulator tank, a clear well, two sand filters, three activated carbon filters,

DONALD MacDONALD
McGraw-Hill News Bureau, Detroit

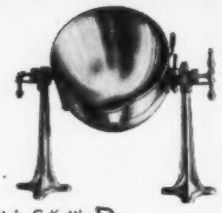
LEE *Corrosion-Resistant* PRODUCTS

For Reduced Processing Costs

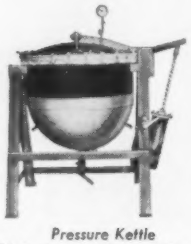
Style CW Kettle
⅔ Jacketed, 80 to 300 gal.



Style A Kettle
⅔ Jacketed, 5 to 500 gal.

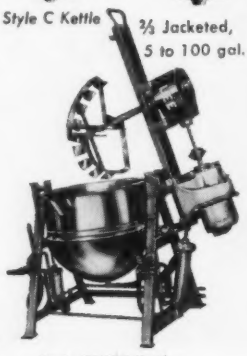


Style C Kettle
⅔ Jacketed, 5 to 100 gal.



Pressure Kettle
⅔ Jacketed, 40 to 200 gal.

Style B Kettle
Full Jacketed, 10 to 300 gal.

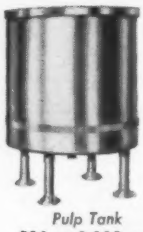


Style CW3T Kettle
with Center-Line Scraper Agitator, 80 to 300 gal.

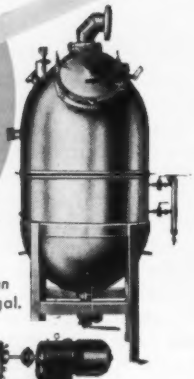
KETTLES

TANKS

PANS

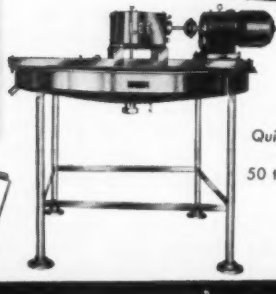


Pulp Tank
500 to 2,000 gal.



Vacuum Pan
30 to 500 gal.

Storage Tank
100 to 5,000 gal.



Quick Cooling Pan
50 to 200 gal.

Write for bulletins on any of the products illustrated.

LEE
METAL PRODUCTS COMPANY, INC.

ALL LEE KETTLES ARE MADE TO A.S.M.E. CODE.

Kettles, Plain and Jacketed | Tanks, Processing and Storage | Agitators and Accessories | Vacuum and Pressure Equipment

416 PINE STREET, PHILIPSBURG, PA.

and two mixed-bed resin tanks. Also, there are tanks to mix the sulfuric acid and caustic soda needed to regenerate the resin tanks, and an ordinary softener (using sodium aluminate and lime) to reduce hardness from an average 7 to 4 grains.

The 9,000 gal./hr. system employed in the main plant treats all water used in beer making. In the second plant, a 6,000 gph. system is used only for purifying cleaning water, but Goebel hopes that sales will eventually warrant employing this system, too, for beer making. In any case, deionized-water capacity is sufficient for the most optimistic forecast.

Softened city water is first fed into a 9,000-gal. coagulator tank, then decanted into clear well. From here on, two systems are dualled, permitting brewing operations to continue while regeneration of the components takes place.

Two 100 gal./min. pumps feed water into one or the other sand filters to remove sediment, next it goes into the activated carbon filters to remove odors. Water then passes through one of the two mixed-bed resin tanks, which remove positively and negatively charged impurities. In the mixed-bed principle, the different specific gravities keep the two types of resins separated in the tanks.

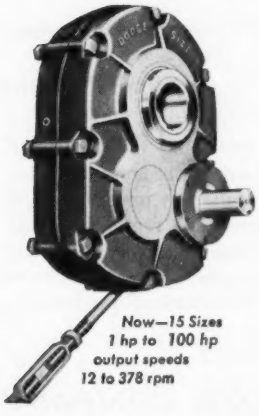
Water conductivity is kept between 0.2 and 2.5 micromhos. Conductivity above this touches off an alarm, signalling that regeneration is needed. —*End*

"Well, he just wandered over here and tried it. But why should he be concerned? He owns the company!"

Torque-Arm

SHAFT-MOUNTED SPEED REDUCERS

Save Up to 1/3 in Installation —Deliver 97% Efficiency!



Now—15 Sizes
1 hp to 100 hp
output speeds
12 to 378 rpm

Easy to install! Mounted directly on the driven shaft. Locked at both ends. Dodge Torque-Arm Speed Reducer requires no foundation, no flexible coupling, no sliding base, and there's no lining-up problem. Amazing economy is matched by efficiency in operation—up to 97%.

Unit is driven through V-belt drive. Stock Taper-Lock Sheaves prescribed for each job, permit speed ratios required. Tri-Matic Overload Release and backstop available, if desired. Dodge Torque-Arm is America's most complete line of shaft-mounted Speed Reducers. Ask your Dodge Distributor—or write us.

•

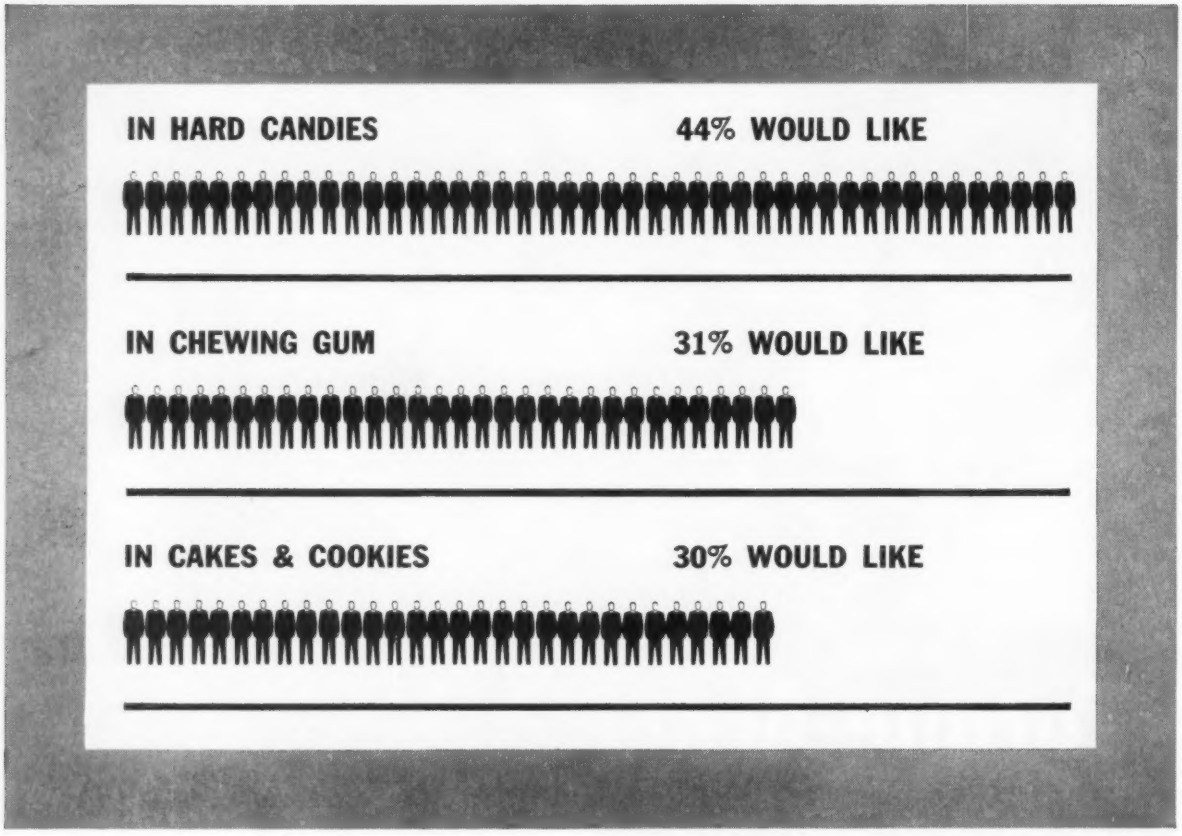
DODGE MANUFACTURING CORPORATION
2800 Union Street, Mishawaka, Indiana

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new methods. Look for his name under "Power Transmission Machinery" in the yellow pages of your phone book—or write us.

DODGE
of Mishawaka, Ind.

For more data, circle this page number on card at back →

34,000,000 ADULTS WANT THIS FLAVORING



Anethole is the Answer!

Wherever flavoring is important, this recent survey by the Gallup Organization is revealing new markets for anise among one out of three adults. Trained Gallup Poll interviewers determined that anise, or the closely similar flavor, licorice, is preferred by millions in a wide variety of products. Here are some additional facts from this nation-wide survey:

- 34,000,000 adults (out of an estimated 103,000,000 U. S. adult population) are real fanciers, while another 16,500,000 adults like the flavor.
- A larger proportion of the fanciers is in the upper economic group.
- Slightly more women than men like anise flavoring.
- More younger adults than older persons say that anise flavor would appeal to them.
- Anise flavoring is more popular in the East and West and in communities of over 500,000 population.
- Those who like the flavor are strongly in favor of it!

Hercules anethole, a domestic equivalent to imported anise, is produced from a plentiful domestic raw material source to meet U.S.P. specifications. Anethole represents a dependable source of supply for a high quality product. Ask your regular supplier for Hercules anethole or flavors based on anethole, and include anethole-flavored products in your line.

HERCULES® ANETHOLE

HERCULES POWDER COMPANY
INCORPORATED
Wilmington 99, Delaware

NC 58-1

← For more data, circle this page number on card at back

CASE HISTORY OF MONTH

From files of National Consumer Panel Division of Market Research Corp. of America. Material is factually correct. Identities of products and companies have been masked to insure anonymity.—The Editors

Found Brand Was Worth Saving

Management's problem

OUR BRAND'S volume has suffered a long declining trend in a highly competitive market. Promotional expenditures were greatly stepped up, but this resulted only in modest and unsatisfactory volume gains.

In view of the present need to concentrate our efforts on items which will make a significant contribution to overall corporate profits, should we let the brand die?

WHAT WOULD YOU DO?

Management's decision

Before taking final action, we decided to find out who was actually buying the product, and how it was regarded by the people who had used it. This was done simply and quickly by checking available records to determine two things:

1. The degree to which the brand was attracting new users.
2. The brand's success in obtaining critically important repeat purchases.

Result of action

Our research showed that consumers apparently liked the brand once they tried it. This was indicated by the fact that the hard core of steady users was slowly building up.

On the other hand, volume represented by new buyers was not growing sufficiently. Hence the answer lay in attracting new buyers.

Thanks to the product improvements and the promotional activities which had already taken place, it was clear that there existed a sound base for future product growth. What we needed was special emphasis on steps to attract new users, thereby broadening the consumer base.

As a result of being able to ascertain quickly that the product itself was not responsible for the sales problem, and finding a clue to the type of merchandising most likely to stimulate volume growth, we avoided the costly error of giving up on a brand in which we had made a considerable investment.

For more information, write to Case-History Editor, FOOD ENGINEERING, 330 West 42nd St., New York 36, N. Y. Your inquiry will be directed to source of case-history item.

we follow tried-and-true recipes too...

for VICTOR BELTING

Exact measures of the best materials—careful processing techniques—they're as much a part of making Victor Belting as they are of making your food products.

To make sure that we're following the *right* recipes, our research department keeps careful, continual checks on *everything* that goes into Victor Belting and *every purpose* for which it's used. That's why—with complete confidence—we recommend for *your* food handling:

VICTOR SUPRENE... special-woven cotton duck belting thoroughly impregnated with exclusive Neoprene compound. Waterproof, highly resistant to grease and most food chemicals, smooth-surfaced, and easily cleaned.

VICTOR 475...highest quality solid-woven cotton belting impregnated and coated with a special Neoprene compound. Developed for use where laboratory cleanliness is a *must*. Washable with hot water or steam. Resists rancidity and deterioration.

For food handling the modern sanitary way select from—

A COMPLETE LINE Including:

• Neoprene Belting • Balata Belting • Solid-Woven Belting—untreated, impregnated, coated—many widths and plies • Canvas Stitched Belting • Belting Specialties.

Victor
Balata & Textile Belting Co.
53 Park Place, N. Y. 7
300-6 W. Hubbard St., Chicago 10
Factory: Easton, Pa.

You get *widest container variety* from

From 2½-gallon pails to 55-gallon drums – including stainless – U.S. Steel offers the widest industrial container selection of all. Chances are there's a container here that's best for your needs. Your U.S. Steel representative will be glad to help you select the right one.

Profit from all 5 of these U.S. Steel extras, too:

- **Eye-catching containers** – your containers not only ship your product, but advertise it, too – when color-decorated by U. S. Steel.
- **Best rust protection** – there's more zinc phosphate on every USS rust-inhibited container.
- **Prompt container delivery** – a 7-point factory system gives you next-door service anywhere – any time.
- **Personalized container service** – your U. S. Steel salesman makes it his business to understand yours – to help you get the right containers for your needs.
- **Longer container life** – extra zinc phosphate gives your containers a safer, longer lifetime.

UNITED STATES STEEL PRODUCTS
DIVISION
UNITED STATES STEEL CORPORATION
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Los Angeles and Alameda, Calif. • Port Arthur, Texas
Chicago, Ill. • New Orleans, La. • Sharon, Pa. • Camden, N. J.

USS STEEL DRUMS

UNITED STATES STEEL

Gives Chain Buyer Profit Facts

With purchasing committees taking over the function of the grocery buyer, food manufacturers will have to polish up their techniques for getting new products on store shelves. Shift in function means it's harder for manufacturer to present his sales story to the man who makes the decision on whether to take-on the item.

Recognizing this, Nestle Co. is trying a different kind of approach to get distribution of its new Nescreme. Company market tested the product in Portland, Me., and Roanoke, Va. and what was figured to be a three months' supply was sold out in 10 days.

Results of the test enabled the company to draw up a complete sales story detailing the product's volume and profit per linear foot of shelf space—two key facts chains are interested in. Armed with these facts, chain buyer can now tell the buying committee what can be expected from the product.

Who Buys Your Products?

The vast array of goods in today's large-size supermarket has made shopping more of a family affair, increased the role of the male shopper. Who does the actual purchasing is being researched more and more, because success of an advertising campaign often depend's on whom it is aimed at.

A survey, last year, by *Progressive Grocer* of 10,000 Super Valu customers showed that 50% of the shoppers were women, 31% men. Further, that women shopping alone spent 35¢ of the food dollar, men alone 14¢, and couples 21c.

McCall's, the women's magazine, reports that survey findings covering 1,090 families tend to show that the little woman still does the bulk of the buying. This magazine contends women bought 88% of all hot cereals (except oatmeal), 87% of the soups, cheese, and coffee, 94% of the milk, and 88% of the baked goods.

Institutional Field Beckons

With retail store shelf space getting harder to obtain, manufacturers are looking to institutional and industrial fields for expanded sales. The two fields each buy about $7 billion worth of food annually, National Food Brokers Assn. estimates.

Key factors that must concern manufacturers who want to push sales in these other fields, NFBA points out, are present and future commodity markets, product quality, and product formulation. Here, advertising, stocking space, and merchandising are not so important.

Lent Sparks Cooperative Campaigns

Beginning of Lent this month will see the kick-off of several coordinated campaigns. General Foods and Carnation have ticketed a $500,000 drive behind Minute Rice, Carnation evaporated milk, also tuna and cheese products.

Salad buffet promotion will bring together California Cling Peach Advisory Board, American Dairy Assn., and Fritos. Annual wine and cheese promotion will be carried out by Wine Advisory Board.

Dixie Cup will support cottage cheese sales with a packaging premium program. Supplier is offering dairies 12- and 16-oz. containers in Easter designs.

Recipes Get Big Play

Mass distribution of recipes is being used to encourage greater usage of food products.

General Mills inserted, as an advertisement, its 28-page Bisquick cook book in the January issue of *Ladies Home Journal*. Company hopes that magazine's circulation, combined with its own package distribution, will send recipes into 11 million homes.

Winning recipes in Pillsbury's 9th Grand National Bake-Off will appear as a cookbook ad in February issue of *Better Homes & Gardens*. The baker is cooperating with six other concerns.

BRIEFS

Campaign pushing "kitchen" uses of aromatic bitters is widening consumer acceptance for Angostura-Wupperman. Firm reports Angostura sales running "far ahead" of the trend in the liquor field, indicating that the bitters are being used more widely as a seasoning agent in food.

Don't sell product quality short, regardless of all the hulabaloo about time-saving features. Seabrook Farms says that market research preceding its "Round the World Dining" line showed 55% of the women rating quality as topmost consideration, as against 28% putting ease-of-preparation first.

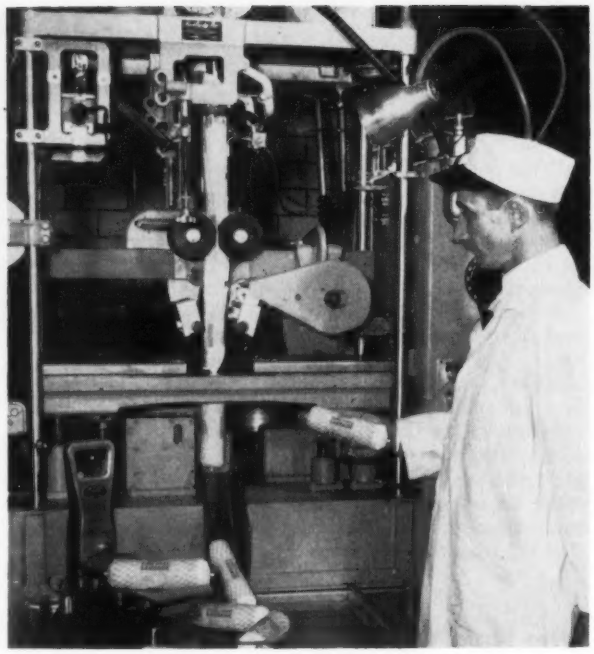
Extension of peak prune sales beyond the traditional January-April period is objective of new California Prune Advisory Board campaign. Aimed at institutional trade, drive will stress menu-variety recipes.

Retailers will get a chance to share in the bonanza of giveaways supplied by manufacturers. Food Specialties is offering choice of a '58 Cadillac or $5,000 to grocer who puts up most original display of Appian Way pizza mix for a minimum of one week.

Coordinated programming by manufacturer and retailer during recent Food Store Spectacular boosted sales of participating national brand foods 110%. National Assn. of Retail Grocers and *Saturday Evening Post*, co-sponsors, will repeat event Sept. 18-27 this year.

With advertisements in 240 newspapers in over 200 cities, Beatrice Foods is putting a particular push behind Meadow Gold ice cream. Its advertising budget exceeds $5 million, or 1.5% of sales.

▲ **THE PACKAGES:** More uniform and attractive sausage items offer greater sales appeal and consumer convenience. And they cost packer less. Replaced are old double-wall cellophane bags.



THE MACHINE: Multi-function unit, run by one ▶ operator, forms and seals roll-fed polyethylene into tube for package. Then it accurately fills product and metal clip-seals both ends. Seen is Oscar Mayer operation.

Better Packaging—At Neat Saving

By switching from pre-formed bag to less-costly roll-stock polyethylene handled by mechanized chubber Midwest packers launch top-appeal bulk-sausage products . . . Other benefits and potential food applications cited

HERE'S A REALLY happy combination—an improved packaged product for less, with a step-up from semi-automatic to more efficient, fully mechanized operations.

Employed to turn out the 1-lb. bulk pork sausage item, it's already profiting John Morrell & Co., Oscar Mayer, and Rath, with others planning to adopt it.

In this advance, polyethylene (2-mil thick) is substituted for double-wall cellophane bags, and an automatic Kartridg-Pak machine replaces the manually operated volumetric fillers that have required hand tucking or tape-sealing of package end-folds.

The multi-duty unit takes roll-stock film (7¾-in. wide) and forms and seals it into a chub-style tube. This is then accurately filled with 1-lb. charges of product, and aluminum clip-sealing at both ends finishes the packages at speeds over 1,800 hourly.

In contrast, the former semi-automatic volumetric filling handled about 900 packages of sausage an hour.

Big advantage, according to users, is the estimated penny-per-package saving—about half in the packaging material (0.5c. vs. old 1.2c. or more) and the other half in labor. Further packaging-material savings are anticipated, since the price of the polyethylene is expected to drop as that for cellophane rises. Factor, too, in giving polyethylene the nod is its desired gas permeability.

Other benefits—

. . . **Neater package:** Former end-folded bag is replaced by more attractive four-color printed package clip-sealed at both ends. New smooth polyethylene package is uniformly round and springs back into shape upon release of pressure. And product does not "grease out" onto package.

. . . **No more bags.** Chub-style roll stock-formed package instead of lower-performance pre-formed bags.

. . . **Further mechanization:** Steps before and after Kartridg-Pak packaging can be automated. Like such table-ready items as meat spreads and liver sausage (FE, July '56, p. (171), pork sausage from grinder might be directly pumped from an air-impact mill to the chubbing machine (by-passing chop-mixer and stuffer). Or product could be directly auger-fed to packager. And the round package more easily lends itself to mechanized carton packing.

Out Goes Guesswork

. . . **Merchandising potential:** Attractive package bids fair to boost sales, and readily adapts to frozen food cabinets.

. . . **Consumer convenience:** The round-shaped product is more easily cut into uniform patties, without guesswork of squeezing out portions

and hand-forming them. What's more, there isn't as much tendency for bits of product to adhere to this package. With careful selection of the right density polyethylene (of which there are about 75 types), a non-sticking film may be obtained by the processor.

. . . **Machine flexibility:** Katridg-Pak unit can be adapted to packaging of other products, such as meat spreads and braunschweiger. And it can be used with a variety of other films by interchanging electronic and heat-sealing devices.

Since certain types of Mylar film are heat-sealable, the door is now open to chub-package a wide variety of the pre-cooked convenience-type frozen foods in boil-in-bag packages. Moreover, package sizes can range from ¼ to 3¼-in. dia. and 3 to 9-in. lengths.

. . . **Accurate weight control:** The new mechanization lends itself to more uniform filling than semi-automatic operations. Metering pump accurately controls weight of product packaged.

. . . **Other products:** Use of this packaging method for ground beef offers big potential. Also worth exploring is its possible employment for cake icings and batters; pie, biscuit, and cookie doughs; jam and jellies; peanut butter; chop suey and chow mein; meat sauces and spreads; soups; confections; corned and roast beef hashes; chili; ice cream toppings; whipped butter and margarine; and ice cream. And other items will come to mind.

. . . **Space savings:** The 7½-ft.-high packaging machine takes up only 2½x4½-ft. of floor space.

For the record, two machine modifications had to be made before polyethylene could be handled by the unit.

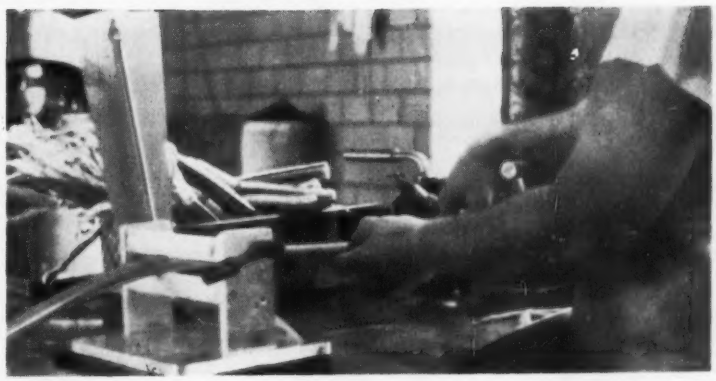
First was the problem of the film adhering to the heat-sealing bars (employed to handle Saran) which had to be overcome.

This was solved by a specially designed heat-sealing device that "jets" hot air at the packaging-forming section to overlap the polyethylene tubing, then applies cold air to "set" the seal.

Second was the problem of clipping the ends. Here, it was necessary to eliminate residual product in the areas to be metal-clipped.

Answer was a "voiding" device —a pair of horizontal rollers that squeezes back residual product to provide clear areas for clip-sealing.

—FE Staff



EASY-TO-RUN caliper measures franks coming out of stuffer, abolishes time-consuming checkweighing by individual girl packers.

Ends Checkweigh Routine

Caliper that continuously measures stuffed franks speeds packaging, saves on give-aways

A SIMPLE instrument that does away with routine checkweighing of frankfurters enables a Midwest packer to speed packaging, save labor, reduce give-aways, and gain flexibility.

In use at Wisconsin Meat Products, Milwaukee, caliper (patent applied for) continuously measures diameter of frankfurter-meat emulsion stuffed into cellulose casings varying from 18 to 30 mm. in dia.

Operator merely adjusts dial for casing size and, by controlling hand-feeding of encased meat from pneumatically-operated stuffer, he keeps pointer on dial's center to assure uniform stuffing. If pointer shows casing is under-stuffed, he holds back on casing from stuffer to feed more meat into it.

Developed by company's Vice-President Arnold Bruesewitz, caliper employs two nylon rollers (1x9 in.). Pointer, attached to top roller, indicates on dial the diameter of stuffed casing.

Before this unit was installed, eight girls handled the franks as follows: Six of them selected and checkweighed ten franks to make up a pound. The seventh handled a belt-type top-sealer (Great Lakes) with rotary coder. And the eighth put the packages into shipping cases.

Now the skinless franks go from peeling machine to a short packing belt, flanked on each side with three-girl teams. One girl packs a row of five franks on a cellophane sheet. The next girl adds a second row of five franks, along with a cardboard flat, and the third feeds franks to top-sealing machine.

Resulting double row of packages proceeds to a seventh (and final) girl, who packs them into shipping cases, with only very random scaling necessary. Thus, there's—

1. **Faster production.** With checkweighing abolished, and one less girl on the line, packaging-line operations handle more franks.

2. **Fewer product give-aways.** Packages formerly averaged about 16¼ oz., now run slightly below 16¼ oz. With an average saving of ¼ oz. per package over a 10,000-lb. daily production, this means a saving equivalent to 156 packages a day.

3. **Greater flexibility.** Caliper is also used for measuring Polish and smoked sausage, also smoked bratwurst and similiar products stuffed in cellulose casing.

Further corollary to the new efficiency: With the instrument speeding up packaging, the company installed a Prague Mince Master (Griffith Laboratories) to shorten preparation of frankfurter-meat emulsion. Now, 500-lb. batches are transferred after only ½ min. in the silent cutter (instead of 7-8 min.) to this new high-speed emulsifier operating at about 150 lb. per min. *—End*

SEPARATED AND CLOUDY
—when thickened with flour or ordinary starch.

UNAFFECTED
—when thickened with National's COL-FLO.

How gravies react to freezing and thawing

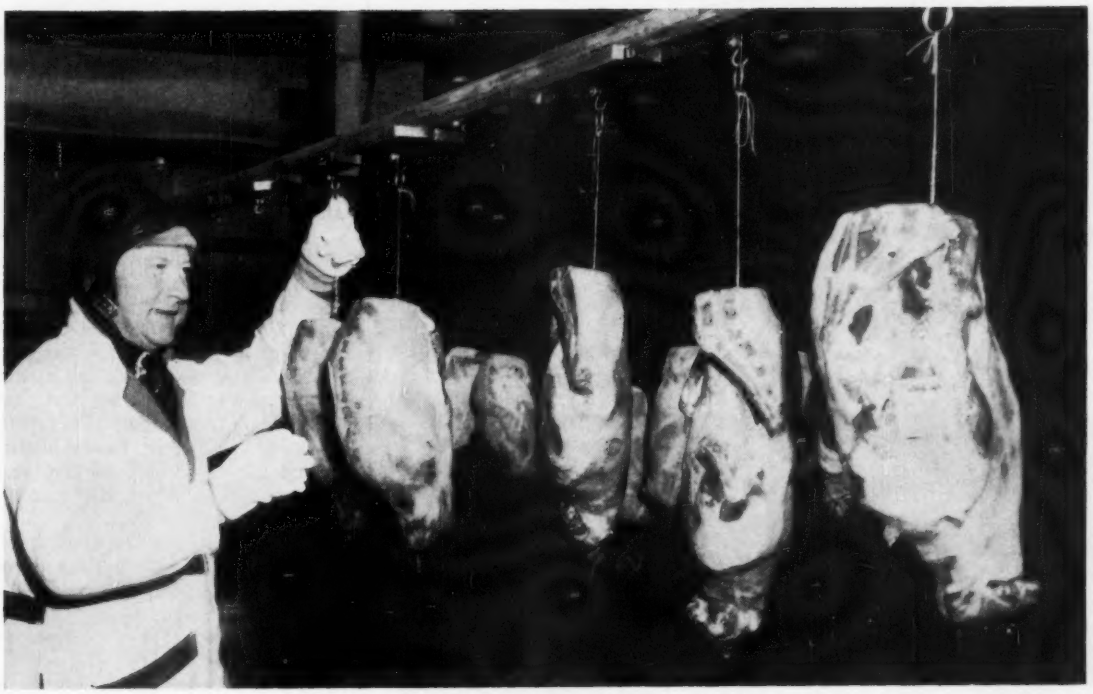
These are actual gravies. Photographed after freezing and thawing. They were made at the same time. Handled the same way. Their formulas differ only in thickening agent. Yet look what's happened to the gravy thickened with flour. Compare it with smooth, appetizing gravy thickened with COL-FLO, a special National starch.

Which would you choose for your frozen foods?

Why not see for yourself how COL-FLO safeguards the quality of sauces and gravies from freezing to eating. Write for a free sample and data sheet.

National
STARCH PRODUCTS INC.

270 Madison Avenue, New York 16 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11



FROZEN MEAT, encased in air-tight plastic dip-coating that locks in flavor and moisture, is shown on its way back to the freezer to await shipment. Casing is non-toxic, keeps meat from shrinking, and it doesn't affect product color.

Dip-Wrap For Frozen Meat Cuts

Chemical encases meat with see-through film coating. Wrap eliminates messy drip in cabinets and permits higher stacking . . . Test cuts have kept a year

NEW PLASTIC coating that permits product visibility can hold the answer to a consumer-education bottleneck that has slowed frozen meat expansion. Developed by Seal Fresh, Detroit, the process involves dipping frozen cuts in a chemical solution that completely encases the product. Method holds interest for meat packers whose frozen cuts, marketed in overwrapped cartons that block product visibility, have run afoul of housewives accustomed to seeing the meat they buy.

The plastic-encased meats are being tried out by the Wrigley supermarket chain, which worked with Seal Fresh in evolving the process. Chain has an exclusive 6-months' agreement with Seal Fresh.

Initial consumer reaction has been good—volume of Seal Fresh meats is now up to about a third of the sales of fresh meats in the one store they're available. Wrigley, which is backing the experiment with strong advertising, plans to place the cuts in at least two more stores.

The coated meats are sold from a freezer display box spotted in the meat department. Morey Rosenthal, sausage maker and co-developer of the process, says the 24-ft. box can hold more meat than an 80-ft. fresh-meat case because the elimination of drip permits higher stacking of frozen cuts.

Introductory price of the frozen cuts is the same as that of comparable fresh meats. Rosenthal concedes that the dip process has greater material cost than present fresh meat packaging methods, but he points out that savings in spoilage, waste, and shrinkage compensate for the difference. Competitive pricing should be possible under volume conditions, he believes.

How Process Works

Trimmed fresh cuts are blast-frozen at −20F., then electronically weighed. After price is marked, cuts proceed by overhead conveyor to first dip vat containing the chemical mix.

Meat emerges dripping in plastic coating, which is as visible as cellophane. Product receives a second dip and goes back to the freezer to await shipment.

Dipping is by hand at present, but mechanical dip machinery is now in the prototype stage. Dow Chemical, which supplies some of

Swing To...

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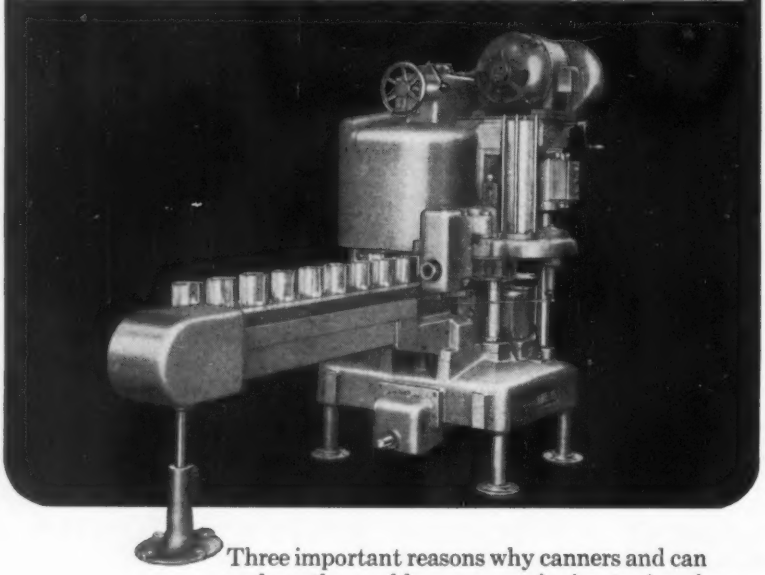

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the ingredients for the mix, is said to be working (with Hygrade and others) on a process of its own which will eliminate the second dip. Rosenthal says the second dip is for obtaining a stickier finish, making the frozen cuts easier to handle and stack.

As for home preparation, meal preferably should initially stand at room temperature for 30 min. Casing, broken by cutting with a sharp knife, comes off readily without sticking

All cuts of beef, pork, lamb, and veal, as well as ground beef, are thus being dip-coated. In experiments by Seal Fresh, frozen plastic-coated cuts were held for one year without loss of flavor, moisture, or weight.

Problems at this stage of development are minor. A couple of them: Getting four frozen chops to stick together long enough for the dip, and marking price changes on meat already coated.

When mechanical handling is perfected, Rosenthal hopes that potential flow on a single conveyor would be 15 to 18 cuts per minute, using 6-in. hook space. Naturally, larger roasts would have to be spread out.

Rosenthal, who is also president of Glendale Provision, a wholesaling firm and parent company of Seal Fresh, plans to license the method to other companies when the Wrigley agreement expires. However, he will reserve selling rights for the raw materials. Glendale will also dip-coat meats for local accounts.

A similar process, involving wax-wrapping of frozen meats, has been introduced by McAllister Dairy Farms, retail chain in Ohio (FE Aug. '57, p. 50). Company today processes around 20,000 lb. a day and sells wax-wrapped meats throughout its 35 stores as well as to schools, hotels, and restaurants in a 100-mile radius.

Efforts to extend the process to frozen poultry and fish were dropped as the result of poor sales.

Since then, McAllister found it necessary to add an overwrap when it was learned that the wax coating didn't screen out light completely, causing the meat to darken. The overwrap is wax-treated paper.

Cracking of the wax was reported to be a problem at one time, but McAllister says that this has now been eliminated by close temperature control in the dipping and cooling process.—*FE Staff*

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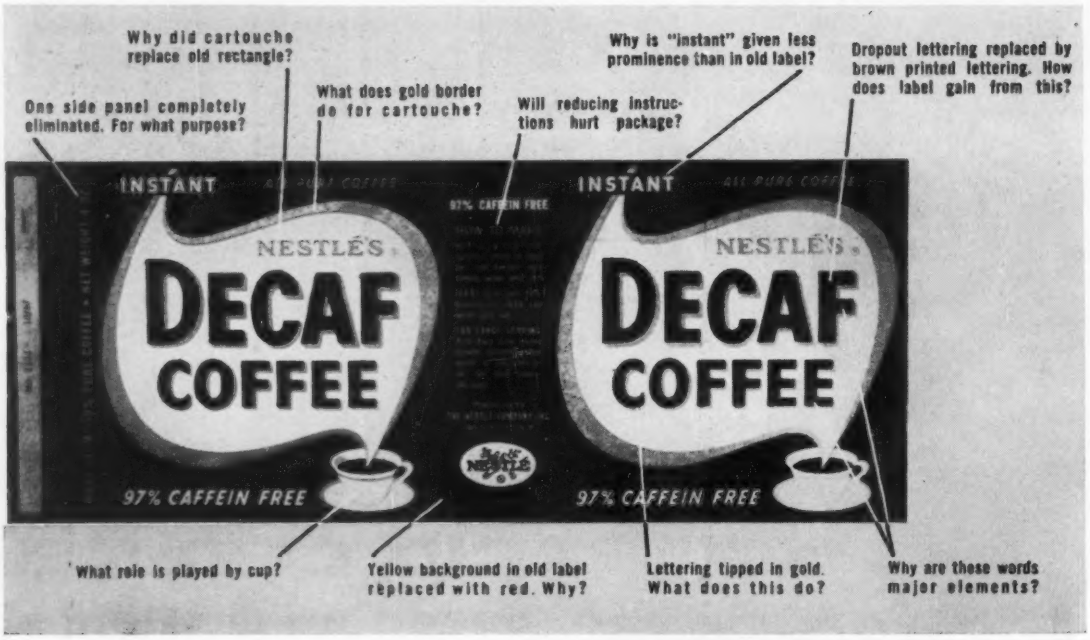

Why did cartouche replace old rectangle?
One side panel completely eliminated. For what purpose?
What does gold border do for cartouche?
Will reducing instructions hurt package?
Why is "instant" given less prominence than in old label?
Dropout lettering replaced by brown printed lettering. How does label gain from this?
INSTANT
NESTLÉ'S
DECAF
COFFEE
97% CAFFEIN FREE
INSTANT
NESTLÉ'S
DECAF
COFFEE
97% CAFFEIN FREE
What role is played by cup?
Yellow background in old label replaced with red. Why?
Lettering tipped in gold. What does this do?
Why are these words major elements?

EACH change made in Nestlé's Decaf label had a definite reason behind it. New elements are particularly designed to build selling power.

Effective Label Redesign Gives

Nestlé changes label to dramatize improved product quality, build a base for merchandising campaign

WITH HEAVY COMPETITION sharpening the marketing tools, you'll see more emphasis on label designs that have built-in selling power. Progressive manufacturers know that the package is their last link with consumers, and that the impression it makes can enhance their advertising's effectiveness, or completely undo it.

Striking example is Nestlé's new label design for its best-selling Decaf.

First off, the new Decaf label design accomplishes three things:

1. **Dramatizes the product's improved quality.** Through a change in the processing method, Decaf now has a richer coffee flavor. The company wanted a new label to help put this point across.

2. **Acts as a key point in a merchandising campaign to give the product national distribution.** Introduced in '54, the item had been available only on East and West Coasts. But last month, the company began introducing Decaf in the Midwest (an area which, except for Chicago and St. Louis, accounts for only 12% of the nation's instant coffee sales).

3. **Exploits the trend to narrower, taller glass jars for instant coffee.** Originally, the jars had squat shoulders, were wider. Now, with shoulders removed, they're taller, have better shelf display.

But here, a mere increase in the size of the old label wasn't "in tune," for it threw the design elements out of balance. Also, a white line running through the center panel, separating "Nestlé's Decaf" from "instant coffee" broke up design unity.

Deciding a change was necessary, the company sent the old wrap to Dr. Louis A. Cheskin's Color Research Institute, Chicago, for analysis. Dr. Cheskin reported the label had good shelf visibility but trailed competitors.

Next step was to hand the redesign job over to Egmont Arens, noted industrial designer. Edward A. Taylor, product manager of Decaf coffee sales, and Herbert Gramstorff, his assistant, suggested that: A strong brand identity symbol be used, red and yellow be retained as the basic colors, a third color be added if necessary, and that the final design be continued on the cap.

CONTINUING red background color to skirt of cap gives added impact to new label. Cartouche that suggests aroma rising from cup of coffee is repeated on cap for harmonious effect.

You Multi-Benefits

In the design exploration stage, Arens, guided by Taylor's suggestions, aimed for a label that, design-wise, built a strong product-brand image, had a striking impact on busy shoppers, and suggested top quality.

Product-brand image. Objective was a symbol that would be synonymous with the product.

The product being coffee, Arens aimed for a symbol that would make consumers think of the pleasures of drinking the beverage. The rectangular center panel, with its block lettering, lacked such imagery.

Manufacturer and designer finally settled on a cartouche, shaped to suggest a delicious aroma, as the focal point of interest. It has a movement' that catches shopper's eyes.

The aroma-like cartouche is seen rising from a cup of rich, brown coffee, thus identifying the product. Further, the cup acts as a link between jar and shopper's appetite.

Eliminated in the cartouche is the solid white line. In the new label, "Decaf" and "coffee" are the major elements. Why? Because the aim was building of consumer loyalty around the product name, Decaf, with emphasis that the product is coffee.

The word "instant" is given a minor position outside the cartouche. Reason for this is that the product is readily identified—because of jar shape and the fact that stores group such items together on the shelf.

Impact. Arens noticed that drop-out lettering, employed in the old label, was the rule among the competitors. Consequently, to make the new label stand out with greater contrast, he substituted printed lettering. For additional emphasis, lettering is dark brown in color, set against the cartouche's white background.

Also changed is the overall background color—from yellow to red. Arens tried a red cartouche on a yellow background. But he dropped it, as overall effect was 'to busy.'

With the cartouche as the central point of interest, changes were made to increase its size, hence strengthen its impact. Space was gained for it by reducing the side panels.

One panel, containing a history or decaffeinated coffee, was eliminated. Reasoning was that people now know what the product is.

The other panel, including preparation directions, was reduced, because people know how to prepare instant coffee.

Quality appeal. Decaf is promoted as a premium product (it usually commands a few cents more than regular instants). Accordingly, the label design should convince consumers they're buying a better-than-average product.

To accomplish this, Arens switched from a plain paper label to paper laminated with foil. Also, he introduced gold touches in the lettering and along the cartouche's border.

The gold is also employed to compensate for the smaller type used for the brand name.

As a final touch, the red background color is extended to the skirt of the cap. Reason is that the former white cap tended to split the elements, making the jar seem smaller. By carrying the red to the cap, the overall impression is harmonious, and the jar appears taller.

The final label was sent to Cheskin for comparison with the old one.

On visibility, Cheskin rated the red background in the new label 14 points above the previous yellow one. But on readibility he checked it 4 points lower.

Meanwhile, the label was sent to other Nestlé firms for comment.

The suggestion came back that the red background be lightened. This was done and the label again sent to Cheskin.

In the new test, the red background gained 3 points more on visibility, and 1 on readability. All in all, Cheskin called it one of the best label improvements he'd ever seen.

—*End*

Using Salt Efficiently

by INTERNATIONAL SALT COMPANY, INC.

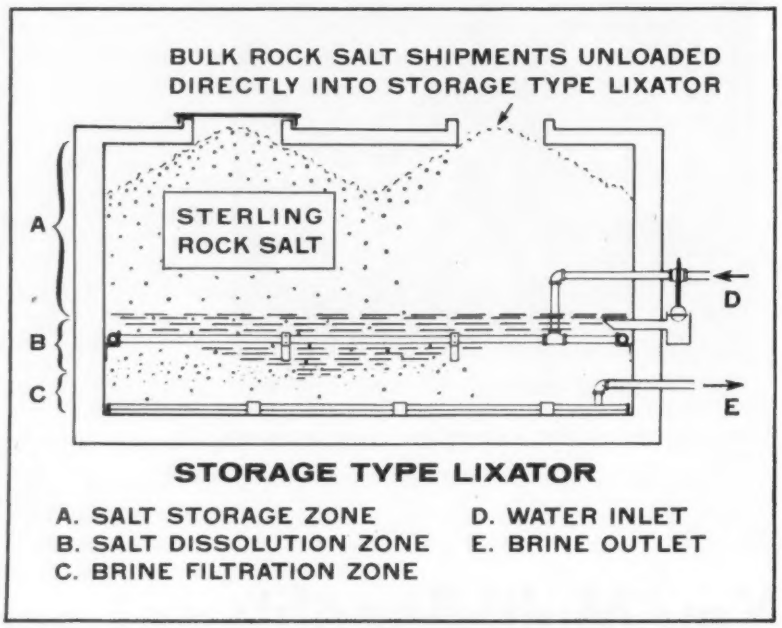
Producing Crystal-Clear Brine at Lowest Cost—by Self-Filtration

Today, more and more companies are using a foolproof brine-making process that produces crystal-clear brine from rock salt, *without using supplemental filter beds or other filtering devices.* This process takes place in the "Sterling Lixator," a rock-salt dissolver developed exclusively by International Salt Company. Operating on International's principle of self-filtration, the Lixator produces a rock-salt brine so high in purity and so brilliantly clean and clear that it can be used in many operations formerly thought to require highly refined evaporated salt.

Here, briefly, is how self-filtration works in the Sterling Lixator: A Lixator is filled with Sterling Rock Salt. Water, admitted near the top, dissolves salt as it flows downward. While flowing down, the brine made in this way becomes fully saturated, and can dissolve no more salt. Still flowing down, this brine is *completely filtered* by the salt-crystal bed in the bottom portion of the Lixator. Thus, the Lixate Brine drawn off through a discharge pipe at the bottom of the Lixator is clean, pure, crystal-clear—and the only source of power used is gravity, which costs nothing!

Other Lixator advantages. In addition to this superbly clean, fully saturated Lixate Brine, a number of other advantages are yours, when you use a Lixator:

- The Lixator permits salt storage and brine making at one location most convenient to the point of salt entry. *Pipes* deliver brine to points of use.
- Because Lixate Brine is piped to points of use, the work of moving dry salt from storage piles to other plant locations is eliminated. This can produce substantial savings in labor.
- The Lixator *automatically* controls salt feed, water feed, and brine discharge. Rapid, uniform brine production is maintained constantly, because in the Lixator there is no bridging, caking, or channeling.



The Storage Lixator — designed for larger operations. This is a combination salt storage tank and dissolving tank. On delivery, rock salt is unloaded directly into the Storage Lixator. The rest is automatic.

Many types of Lixators are available from International Salt Company. In addition to Storage Lixators, there are Silo Lixators and Sterling Model Lixators—in numerous designs to suit any plant layout. And every Lixator operates on the economical self-filtration principle.

For expert advice on the particular Lixator type that will do the best job for you, phone or write the nearest district sales office, or write to us direct. One of our sales engineers will gladly show you how this remarkable brine-making equipment can help you use salt most efficiently and economically.

Using salt efficiently in its many industrial applications calls for technical knowledge and experience. International Salt Company has both. Plus a continuing program of research and development in salt. These things can be put to work for you, in your plant, to help you get the most out of the salt or brine you use.

* * *

INTERNATIONAL SALT CO., SCRANTON, PA.

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Service and research are the extras in **STERLING SALT**

PRODUCT OF INTERNATIONAL SALT COMPANY, INC.

JENKINS PRACTICAL PIPING LAYOUTS

81

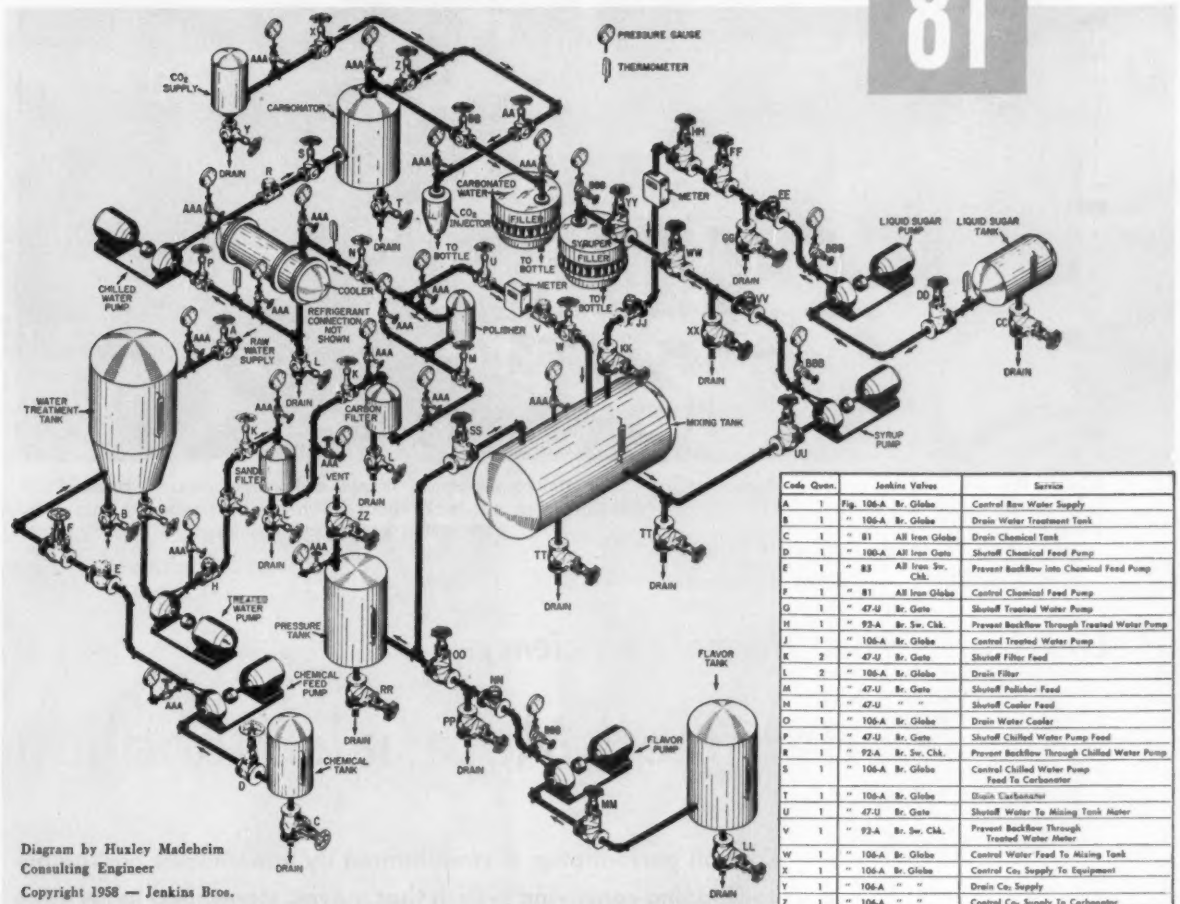


Diagram by Huxley Madeheim
Consulting Engineer

Copyright 1958 — Jenkins Bros.

Code	Quan.	Jenkins Valves	Service
A	1	Fig. 106-A Br. Globe	Control Raw Water Supply
B	1	" 106-A Br. Globe	Drain Water Treatment Tank
C	1	" 81 All Iron Globe	Drain Chemical Tank
D	1	" 100-A All Iron Gate	Shutoff Chemical Feed Pump
E	1	" 83 All Iron Sw. Chk.	Prevent Backflow into Chemical Feed Pump
F	1	" 81 All Iron Globe	Control Chemical Feed Pump
G	1	" 47-U Br. Gate	Shutoff Treated Water Pump
H	1	" 92-A Br. Sw. Chk.	Prevent Backflow Through Treated Water Pump
J	1	" 106-A Br. Globe	Control Treated Water Pump
K	2	" 47-U Br. Gate	Shutoff Filter Feed
L	2	" 106-A Br. Globe	Drain Filter
M	1	" 47-U Br. Gate	Shutoff Polisher Feed
N	1	" 47-U " "	Shutoff Cooler Feed
O	1	" 106-A Br. Globe	Drain Water Cooler
P	1	" 47-U Br. Gate	Shutoff Chilled Water Pump Feed
R	1	" 92-A Br. Sw. Chk.	Prevent Backflow Through Chilled Water Pump
S	1	" 106-A Br. Globe	Control Chilled Water Pump Feed To Carbonator
T	1	" 106-A Br. Globe	Drain Carbonator
U	1	" 47-U Br. Gate	Shutoff Water To Mixing Tank Meter
V	1	" 92-A Br. Sw. Chk.	Prevent Backflow Through Treated Water Meter
W	1	" 106-A Br. Globe	Control Water Feed To Mixing Tank
X	1	" 106-A Br. Globe	Control CO_2 Supply To Equipment
Y	1	" 106-A " "	Drain CO_2 Supply
Z	1	" 106-A " "	Control CO_2 Supply To Carbonator
AA	1	" 106-A " "	Control CO_2 Supply To Injector
BB	1	" 106-A " "	Control Carbonated Water Supply To Filler
CC	1	" *1313 S. S. Globe	Drain Liquid Sugar Tank
DD	1	" 1303 S. S. Gate	Shutoff Liquid Sugar Pump
EE	1	" 1329 S. S. Sw. Chk.	Prevent Backflow Through Liquid Sugar Pump
FF	1	" *1313 S. S. Globe	Control Liquid Sugar Pump
GG	1	" *1313 " "	Drain Liquid Sugar Line
HH	1	" 1303 S. S. Gate	Shutoff Liquid Sugar To Mixing Tank Meter
JJ	1	" 1329 S. S. Sw. Chk.	Prevent Backflow Through Liquid Sugar Meter
KK	1	" *1313 S. S. Globe	Control Liquid Sugar Feed To Mixing Tank
LL	1	" *1313 " "	Drain Flavor Tank
MM	1	" 1303 S. S. Gate	Shutoff Flavor Pump
NN	1	" 1329 S.S. Sw. Chk.	Prevent Backflow Through Flavor Pump
OO	1	" *1313 S. S. Globe	Control Flavor Pump
PP	1	" *1313 " "	Drain Flavor Line
RR	1	" *1313 " "	Drain Pressure Tank
SS	1	" *1313 " "	Control Flavor Feed To Mixing Tank
TT	2	" *1313 " "	Drain Mixing Tank
UU	1	" 1303 S. S. Gate	Shutoff Syrup Pump
VV	1	" 1329 S. S. Sw. Chk.	Prevent Backflow Through Syrup Pump
WW	1	" *1313 S. S. Globe	Control Syrup Pump
XX	1	" *1313 " "	Drain Syrup Line
YY	1	" *1313 " "	Control Syrup Supply To Syruper
ZZ	1	" *1313 " "	Vent From Pressure Tank
AAA	18	" 106-A Br. Globe	Control Pressure Gage
BBB	4	" 1312 S. S. Globe	" " "

*Or Fig. 1317-A, Multiple Bolted Bonnet Globe

How to plan piping connections for

A CARBONATED SOFT DRINK BOTTLING PLANT

Preparation and bottling of soft drinks, requires a supply of treated water for diluting concentrated flavors in the mixing tank, thus making the syrup which is fed into bottles or cans by the syruper. Another operation carbonates water and feeds it into the bottles as the second ingredient. This layout also may be used for a "pop" *canning* plant, by changing the connections out of the three fillers.

The water treatment system here is typical. Bottles (or cans) are first filled with syrup from the mixing tank, then filled with carbonated water and, just before closure, injected with carbon dioxide gas to eliminate air.

Water treatment lines are red brass or copper with bronze valves and bronze-fitted pumps. The chemical line is controlled with all-iron valves to minimize effects of alkali corrosion. Stainless steel liquid sugar and flavor lines have stainless steel valves.

Either the Jenkins Fig. 1317-A Globe Valve or Fig. 1313 Twin Bolt Body Globe Valve (shown in the layout) is recommended. Jenkins Fig. 1317-A has the advantage of a multiple bolted body-bonnet joint which assures absolute tightness yet permits easy dismantling for cleaning or renewal of parts.

For details of valves to suit varying conditions see Jenkins Catalog. Consultation with accredited piping engineers and contractors is recommended when planning any piping system. Jenkins Bros., 100 Park Ave., New York 17.

JENKINS
LOOK FOR THE JENKINS DIAMOND
VALVES
JENKINS SINCE 1864
Jenkins Bros
Sold Through Leading Distributors Everywhere

FLOW-RACKS (left) are heart of "stop-and-go" system controlling movement, storage, and transfer of cased goods. Products chuted and conveyed from packaging department are loaded into racks, from which they're transferred onto order conveyor.

Link that zoomed Hormel's efficiency—

Modernized Materials Handling

Overall performance is consolidated by streamlined packaging-to-shipping conveying system that moves, stores, and loads more than 700 varieties of cased goods — winning 20 big benefits

YOU CAN HAVE advanced equipment and most modern processes—and still not gain the top operating efficiency you've looked for, or achieve all the cost reductions you've envisioned.

This situation—run into by many a food company—is a sure indication that *something else* is lacking.

In the specific case at the Austin, Minn., plant of Geo. A. Hormel & Co., it didn't take management long to spot that "something else." Here, the missing factor was streamlined materials handling for smoothly whisking processed products from packaging lines, through order selecting areas, and into outbound "shippers".

Forthwith supplied, that factor has now improved the plant's whole operating picture, to the tune of a score of solid benefits (see accompanying panel, p. 90).

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

Management in Action

The materials-handling modernization project was launched three years ago by a management task force. Its goal was to search out the best, most-applicable facilities, and arrange their installation in such manner that routine plant operations would continue without a day being lost.

The team comprised E. H. Flitton, manager of transportation; Denver Daily, transportation superintendent; C. H. Dugan, transportation supervisor; and Frank Brown, engineering.

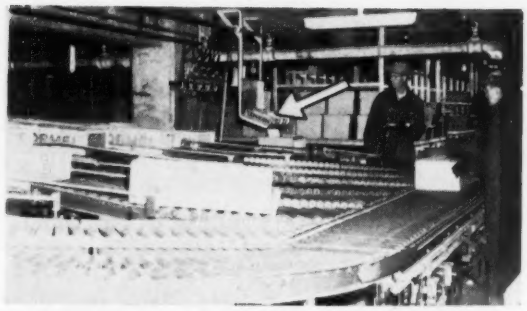
To establish the working basis, this group stringently analyzed every last detail—and so spotlighted significant profit-waste factors.

It found cased goods were handled eight to twelve times as they were trucked and elevated from multi-story production areas to second-level assembly rooms. In the latter, they noted how orders were manually made up in skid-lots for truck movement to the loading dock —to again be re-handled into outgoing RR cars or trucks.

There was considerable confusion and lost time in the order-assembly routine, with more than 700 varieties of products to take into account. Furthermore, these many items were scattered in three different assembly rooms.

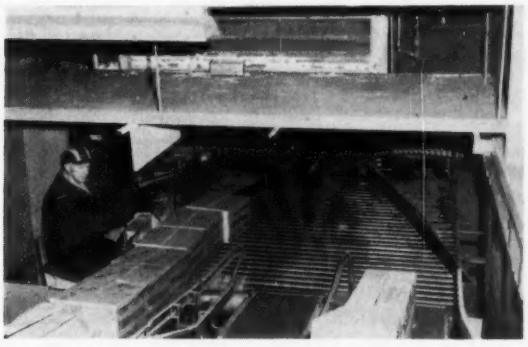
Nor was that the whole complication. There were also more than 300 different-size cases, varying in construction—wood, cardboard, fiberboard, and wirebound. And these ranged (height-width-length) up to 16½x19x44 in. Some, too, were often bulged due to freezing.

4 Key Handling Stations

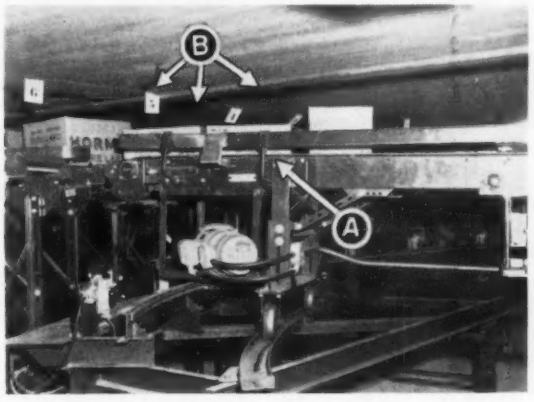


HEAVY-VOLUME boxed fresh meats by-pass Flow-Rack and are marshalled onto these nine express conveyors by mechanically-operated switches controlled from panel. Boxed goods are discharged from conveyors by manually operating pushbuttons (arrow).

BY OPERATING pushbuttons, flow of order-marked cased goods from racks in assembly coolers is merged from three lines carrying scrambled orders into single file on one of three conveyors. Latter accumulate assembled orders.



DISPATCHER discharges orders from three accumulating conveyors onto specially designed transfer unit.



FLOW of cases is delivered by electric transfer unit (A) to any of seven conveyors (B) feeding to loading.

All of which added up to a need for action. And that action—in the form of "storming" for ideas by intensive reading of technical magazines and visiting a number of plants with advanced materials-handling facilities—resulted in a cream-of-the-crop sheaf of proposed layouts by the engineering department.

Considered were such methods as revolving sorting tables, loaded skids attached to overhead conveyors or floor rails, power trucks combined with conveyors, etc.

Thumbs were down on the conventional approach—constructing a building around the layouts. Economics wouldn't justify such new construction costing over $500,000. So the task force then limited itself to planning a new materials-handling system within the existing facilities.

From this planning came the big idea—a "stop and go" concept of materials handling, involving controlled movement, accumulation, and transfer. This solution 'measured up', and accordingly was implemented.

The new system, installed a year ago, is designed to handle cased goods into delivery. Accommodating about a day's production, it carries goods from packaging departments into refrigerated rail cars or trucks. Goods are loaded LIFO (last in, first out) in proper pattern for the sequence of unloading.

Five miles of gravity conveyors, along with 105 power-conveyor sections, are employed to move the goods. And there are 10 miles of Flow-Racks to "live-store" products.

The entire new conveyor and rack system (Rapids-Standard) was installed by Adrian Drew Co., with modifications made by Hormel engineers.

Keying the system are three rack installations that simplify receiving, storing, controlling inventory, order selecting, and shipping. Each unit is a combination of steel rack storage uprights, with cross members and conveyor wheels set at a slight pitch so that case goods flowing into them gravitate forward.

Salient in getting prime effectiveness in the new system was the overall "teaming up for modernization", involving the coordination of such management functions as transportation, engineering, production planning, sales, and industrial relations. Keeping all departments informed of progress greatly contributed.

Smart Loading System

A few words about the Hormel-devised loading system and how it's been engineered:

Cars to be loaded are lettered (A, B, C, etc.), while customer orders

System Scores 20 Gains

Hormel's new installation has chalked up these many benefits:

1. Moving over 700 varieties of packaged products in different-size containers of varying types—in systematic, straight-through, but interrupted, manner—from production, through order filling, to outbound cars or trucks.

2. Consolidating and systematically storing products, instead of having them scattered in three assembly rooms.

3. Greatly speeding cases. Goods can be whisked the maximum distance of 1,600 ft. between production and loading dock in a matter of 4 min.

4. Loading cars and trucks in a mere 35-40 min.—instead of 1 hr. And carrying out these loadings without interruptions.

5. Reducing handlings. Cased goods are now handled only three times—transfering in and out of Flow-Racks and loading into outbound shippers. . .

6. Thus giving customers better products, since less transfers mean fewer cases are damaged. And there is further minimizing of such hazards to cases through use of automatic flow-cutoffs and company-designed case straighteners set at critical points in the conveying system.

7. Facilitating and safeguarding pool-car shipments. The sequence loading, according to customer orders, eliminates dock exposure of items being made up into pool lots.

8. Getting high utility from 15,000 sq. ft. of former low-utility space. This can be accounted as a $20/sq. ft. saving—in terms of outlay that otherwise would have been necessary for construction of new facilities for cased canned goods near the shipping area. Specifically, conveyors were installed at ceiling level, Flow-Racks were mounted to ceiling height, and balconies were erected to house shipping-dispatching areas. With floors of latter suspended 7 ft. from the ceiling, a usable 10½-ft. headroom remained underneath.

9. Increasing storage facilities about 30% in assembly areas, as well as providing more aisle space.

10. Immediately spotting and correcting flow delays—no hold-ups and lost time tracking down troubles.

11. Aiding sales operations—through quicker more efficient order handling.

12. Enabling production department to carry heavier stocks of items, thus minimizing shipping delays.

13. Bettering safety conditions by cutting down on aisle traffic and congestion.

14. Handling 'railed beef with less interruption and reduced damage to meat, as well as coordinating its flow along with cased goods (by order rotation).

15. Eliminating elevator congestion, by chuting instead of truck-handling cased goods.

16. Reducing number of skids, and minimizing repairs of damaged ones.

17. Doing away with back-ordering. Now that products are rack stocked, order rustlers can more quickly locate them. And they are more easily inventoried, thus simplifying production planning.

18. Improving workers' morale. The old back-breaking manual handling of heavy packaged products has been abolished.

19. Providing new flexibility—through permitting adjustment for varying loads, also both assembly of products for storage and orders for shipment.

20. Maintaining routine production and delivery during the change-over to new system.

are numbered (1, 2, 3, and on). Three cars can be loaded simultaneously with, say, 10 individual orders going into Car A, 50 into Car B, and 100 into Car C. Dispatchers work ahead—arranging orders for the next three cars, while the first three are being loaded.

Correct sequence is controlled on a master-order assembly sheet. Thus, order assembly is guided in a three-way series (for three cars) across the sheet.

For example, a sheet-line being worked by the dispatcher may be A-10, B-11, C-8, to be followed on completion by the next three-series sequence.

A separate order sheet is prepared for every customer for each of the three assembly rooms (dry sausage & fresh-meat products, sliced bacon & smoked-meat products, and fresh sausage items). On these sheets, code numbers are listed in front of cases so the dispatcher in each assembly room may check his items.

Dispatcher calls out product and order number. Then an assembly man, or "order rustler", transfers cased goods from Flow-Rack to conveyor going to the coordinating station.

When picking up cases from the discharge end of rack, this rustler wax-pencils them—A-1, A-2, A-3 or B-1, B-2, B-3, etc.—in response to dispatcher's call over the speaker system. Marked cases are conveyed in three lines to the coordinating station, where they are arranged according to order and dispatched to loading spots.

IBM helped perfect the order selecting. It set up a code to conform with product location in the plant. Thus, when an order is built up, the products (say, sausage, smoked meat, and balance of other items) appear in sequence on invoices. This simple system facilitates charging and checking at dispatch station.

Company shipping people spent about a month studying daily inventory sheets over the preceding two years to determine maximum amount of the more than 700 different products that had to be line-stored for any given day. Using these figures, the engineers then designed the specific layout of racks.

But before they were installed, a test rack was constructed. It led to development of standardized plywood pallets (three sizes for each of the three assembly rooms). These simplify movement of single or stacked cases (up to seven piggy-backed) through the racks, also prevent damage to cased goods.

The pallets have a pair of metal-strip guides that prevent loads from deviating when moving over rack's skate rollers. Spacing between the tiered racks allows movement of loads of different heights along these gravity pitches.

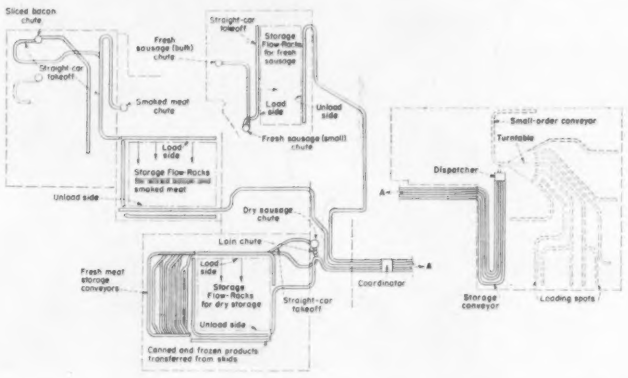
As for returning empty pallets to load end, this is accomplished by an adjacent smaller, modified rack system. Empties are inverted and placed in these racks for gravity return.

A separate problem for the engineers was how to bring products to, and carry them from, the racks. This brought the production and shipping people into the scene.

Answer was a method of chuting cases directly from packaging onto conveyors feeding the assembly-room racks, thus abolishing truck and elevator movements. Facilities were also devised for straight-car takeoffs at end of chutes.

A means was also engineered to combine the flows of products from

(*Cont'd on page 92*)



'Inside' View of System

Working details of Hormel's streamlined packaging-to-shipping case handling are graphically shown here. The system is particularly designed for multiple-customer shipments (up to 150 per car), these representing about half the output volume.*

System starts with chute-delivery of cased goods from the six main packaging areas, followed by conveying to three assembly rooms equipped with "live-storage" Flow-Racks.

First assembly area: Dry sausage and fresh-meat products (loins, butts, ribs, etc.) separately chute down from two main packaging areas and go onto individual conveyors. Dry sausage items are fed from two production lines, at 600 cases/hr., for manual transfer onto designated racks holding 75 varieties.

Heavy volume fresh pork products proceed directly onto nine 75-ft. express lines parallel to the racks. Operator, stationed at an electronic control panel, calls for products from loin cooler and then marshalls them onto the designated power-and-gravity conveyor express lines by opening and closing mechanically operated switches.

Such transfer to nine lines commonly requires a 4-ft. swing, but it's carried out here in a smaller radius by means of solenoid-operated gates and skate wheel-equipped guide rails coordinated with a special transfer unit riding on small rubber-tired wheels.

In filling orders from any line, another operator pushes a button to depress a raised "stop" conveyor-section so that the designated number of cases proceeds onto an order conveyor.

Then, by a series of gravity and power conveyors, products continue at ceiling level to an accumulating section and join order-selected dry sausage items transferred from racks onto a waist-high belt. Also transferred onto this conveyor are canned and frozen products stored in skid lots.

Flow of products is then merged from two conveyors to a single one at accumulating point by a manually operated shut-off bar. Marked cases (with car letter and customer number) are now conveyed about 300 ft. through an overhead enclosure to a coordinating station.

Second assembly area handles cased sliced bacon and smoked meat products. These are chuted down and conveyed to racks holding up to 90 varieties. Sliced bacon comes from four packaging lines at a rate of 1,200 cases per hour and smoked items from two wrapping lines at 600-case/hr. speed.

Products are marshalled from two conveyors to a single one by automatic timers operating powered in-feed belts on a 10-sec. on-and-off cycle. Cases are transferred in and out of racks and onto conveyor carrying them to coordinating station.

Third assembly area: Fresh sausage products are handled through a third room in the same manner and capacity. Only difference is that smaller and larger sausage products come down separate chutes.

Combining of orders from the three assembly rooms is carried out at coordinating station. Here, an operator pushbutton-controls the flow of order-marked cases from any of the three powered conveyors. The items move onto a wide roller conveyor to be combined by powered monorail guide.

This way, all orders marked (for example) A-1 are combined and diverted onto a roller-storage conveyor for Car A. And when the orders are completed for that car, (running, say, through A-10), he proceeds in the same manner with orders for Car B.

There are three 350-ft. storage conveyors to backlog orders ahead of the balcony-located dispatching station. This backlog supplies working-volume for checkers and chargers so car and truck loading is sped without delay.

Each storage line terminates in a powered conveyor so dispatcher can select pre-assembled orders grouped by coordinator. Dispatcher controls flow of cases over roller conveyor and onto a company-designed monorail transfer unit with powered belt. This feeds the items to any of seven spur lines past checker-chargers and thence to any of 8 truck docks or 14 RR car-loading spots.

The specially designed (Hormel and Rapids-Standard) transfer unit rides on four wheels, rear two on a pivoting table and front two in a channel monorail. The motor operating the unit's belt is hooked up with a Falk shaft-mounted drive.

Unit is operated off solenoids in front of each spur line, with remote control from dispatcher's panel. Volume of orders is regulated on spur lines to keep checkers and charges busy. Orders are fed into cars and trucks by portable conveyors.

*Also indicated are takeoffs for straight (single-customer) car shipments, which are still most economically handled in conventional pallet-and-forktruck manner, with cases gathered at stations just beyond chutes coming from packaging departments.

the three assembly rooms, thus accumulating goods for each order. It comprises facilities to: (1) Pushbutton-coordinate marked cases conveyed along three lines from as many racks, (2) conveyor-accumulate coordinated orders, and (3) mechanically dispatch orders, via a specially designed turntable transfer unit, to seven checking lines feeding 22 loading spots.

Now came the job of fitting the new operation into existing buildings without disrupting water, electric, and refrigeration lines. "Air rights" were claimed by the engineers to run conveyors through the laundry room, plant offices, and other existing departments, without disturbing them.

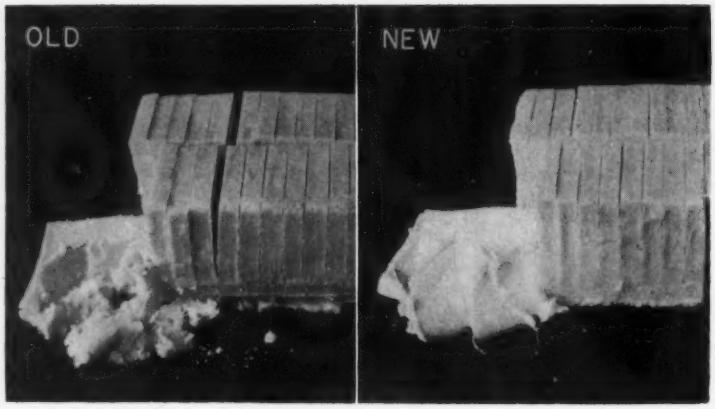
Personnel including the union committee were given the picture of the objectives and operation of new system about a year prior to installation. And some changes suggested by the union helped improve action of the layout. The union has much appreciated the way it abolishes back-breaking work.

Hormel employees, who represent most of Austin's population, with a majority home owners, naturally have a direct interest in the company. They strive to go along with advanced changes so operations do not become obsolete and necessitate decentralization.

What's more, the workers understood that the new system would not lead to layoffs. At Hormel's they've had a guaranteed annual wage for 22 years. And no layoff notice has been posted in the whole time.

—*End*

". . . For our new Non-Fattening Minus-Calorie Humming-Bird Gravy, I daresay this is the more suitable can."



PICTURES SHOW DIFFERENCE. When cold, conventional butter (left) is crumbly, spreads poorly. That made by new technique (right) is waxy, spreads easily.

Makes Better Butter

Special temperature treatments overcome previous difficulties with fall and winter cream. Product doesn't crumble, even when cold

"THE GREATEST development in butter during the present century."

That's the consensus of dairy researchers regarding the product made by a new manufacturing technique developed at Oregon Agricultural Experiment Station.

It comprises special temperature treatments that are applied to the cream after it is pasteurized and before churning.

Resulting product has superior consistency and can be spread smoothly on bread shortly after it is removed from the refrigerator.

The Modified Procedure

Here is a typical manufacturing record of butter made in accordance with the improved method, using a cylindrical wooden churn equipped with two speeds—one for churning, one for working:

1. Sweet cream (1,761 lb.) testing 32% fat was pasteurized by holding at 155F. for 30 min.
2. It was cooled to 46F. and held for 2 hr.
3. Heated to 66F. (using water at 79F.) and held for 6 hr.
4. Cooled to 61F. and held over night.
5. Starter (5%) was added followed by cooling to churning temperature (47F.).
6. Churning time, 30 min.; size of butter granules, large peas; temperature of buttermilk, 52F.; volume of 45F. wash water, 250 gal.; working before first moisture test, 23 min.; speed of churn during working, 15½ rpm.; moisture in butter, 15%; working after water added, 7 min.; total revolutions for working, 465; temperature of butter, 56F., yield, 662 lb.
7. Composition of butter: Fat, 80%; moisture, 17%; salt, 2.2%; curd, etc., 0.8%.

The butter had an excellent waxy, pliable body. There was no moisture on a pound print immediately after cutting. Spreadability was excellent at 48F. Free moisture was determined by an indicator paper impregnated with brom-phenol-blue and HCl.

Butter made by the conventional method was hard, crumbly, and sticky. It was difficult to handle at the printer. In its production the cream was cooled to 40F. after pasteurization and held at this temperature over night. Churning, washing, and working procedures were the same as those detailed above.—*End*

G. H. WILSTER
Professor of Foods & Dairy Technology, Oregon State College, Corvallis.

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FOLLOWING THE BIG FREEZE, oranges fell to ground, trees lost their leaves. Growers rushed to harvest remaining fruit.

FLORIDA FREEZE:

With damage to state's citrus crop estimated at 20%, processors

FLORIDA'S JANUARY FREEZE, following close on the heels of the big freeze of Dec. 12-14, has created problems for frozen citrus concentrators that are more serious than any encountered in the more than a decade since the product was introduced.

Florida Citrus Commission ruled in December that not more than 5% of fruit showing frost damage could be used in concentrate.

But the concentrators were sure they could make an acceptable product from the damaged fruit. So they worked full time in processing them —then packed the product in polyethylene lined barrels instead of cans, and stored it at —10F. for future use.

And the processors apparently won their bet. For on Dec. 29 the commission ameliorated its ruling and permitted use of 15% damaged fruit until Jan. 3, with the tolerance extended to 25% after that date.

However, the commission amended its regulations to provide that frozen concentrate packed after Dec. 12 shall be composed of no more than 30% manufactured or bulk concentrate. Formerly, concentrators could use as much bulk product as they desired. This was amended on Jan. 3 to permit use of 50% manufactured concentrate.

The Commission later ruled that concentrators cannot use loads containing more than 25% freeze-damaged oranges where intention is to ship the frozen concentrate immediately after packing.

If they wish to use more, they may pack directly into consumer-size cans, but these must be held 45 days before the product can be inspected This is to allow for possible off-flavor development.

All finished concentrate must pass USDA Grade A requirements as to flavor, and must also pass a new, higher gelation test.

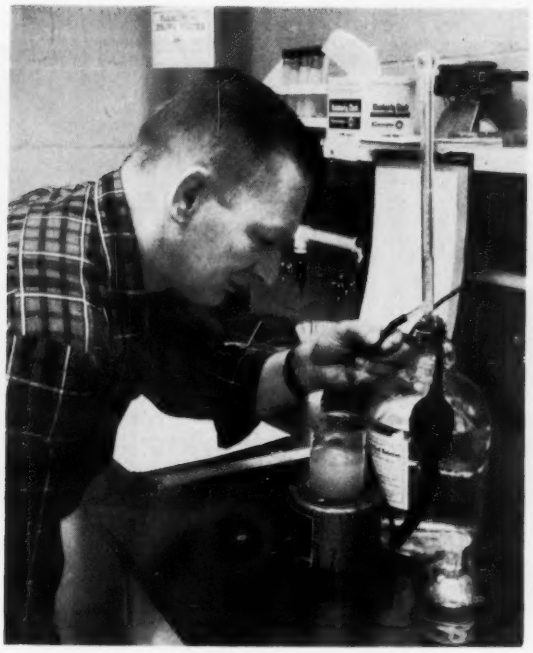
Second, experts from USDA's Orlando bureau estimated that 47% of the unharvested crop of early and midseason oranges was damaged by the December freeze.

These experts have now scaled down their previous estimates of total citrus crop approximately 20%. They wrote off 22 million boxes of oranges, 4 million of grapefruit, 1½ million of tangerines.

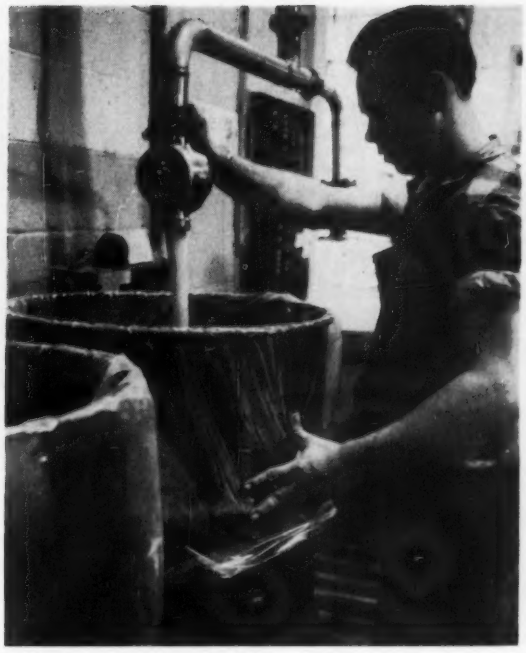
New Processes Introduced

About a week after the December freeze, John M. Fox, Minute Maid president, outlined two new proc-

C. E. WRIGHT
Special Correspondent, Jacksonville, Fla.



QC MEN will play important roles when blends are made from present concentrate and juice from undamaged fruit.



CONCENTRATE was filled into plastic lined barrels, and placed in frozen storage for future use.

Concentrators Map Way Out

come up with new techniques to insure quality of resultant product

esses that would enable manufacture of satisfactory concentrates from freeze-damaged fruit.

The new methods resulted from four years' research at the company's laboratory at Plymouth, Fla., carried on in cooperation with Union Carbide Development Co. Originally, MM had not planned to release the techniques until they had been proven commercially. But in view of the present emergency the time of release was stepped up.

The first method involves screening of juice rather than conventional finishing methods. This eliminates finely ground pulp, the chief cause of instability, gelation, and off-flavors in citrus concentrates.

The second method preserves flavor of the juice through use of an inert gas (nitrogen) in the processing. The gas prevents oxidation that normally takes place after the concentrate has been frozen, thus preventing flavor change during storage.

Inquiries concerning licensing of the processes should be addressed to R. E. Cornwell, president, Union Carbide Development Co. N. Y. C.

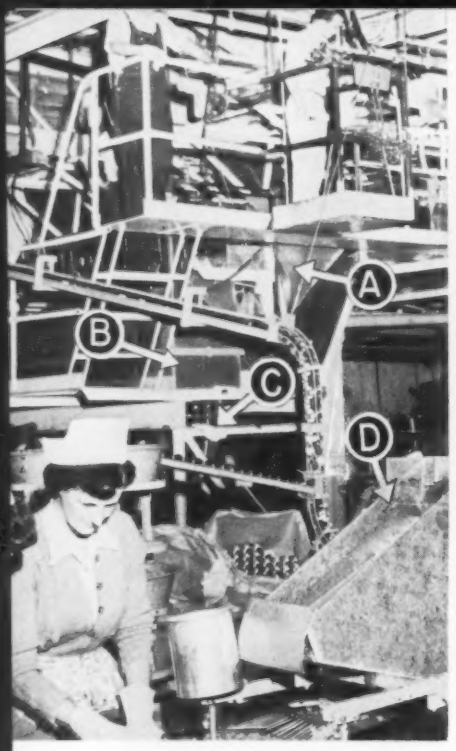
Improved Tests Studied

Possibly more important in the long run was a proposal made by the newly established Concentrate Advisory Committee to the Citrus Commission. It recommended that the state adopt more accurate methods for testing the quality of freeze-damage fruit to be used in frozen concentrate. Present standards, based primarily on needs of fresh fruit shippers, are admittedly inadequate for concentrate purposes.

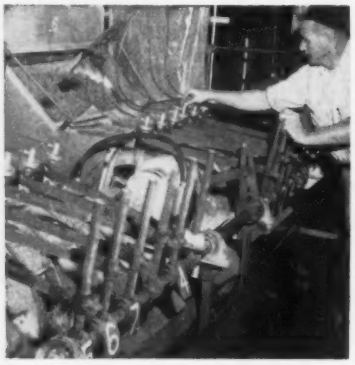
There is no question but that the 1957-58 concentrate pack will be less than was previously predicted. Most processors estimate the pack at 45 to 50 million gal. instead of the expected 75 million. However, this may prove a blessing.

Whether the marketing of frozen concentrates will be made more difficult because of the necessarily higher prices for the finished products remains to be seen. Much will depend, of course, on consumer acceptance of the higher price plus public suspicion that the quality may not be as good as heretofore.

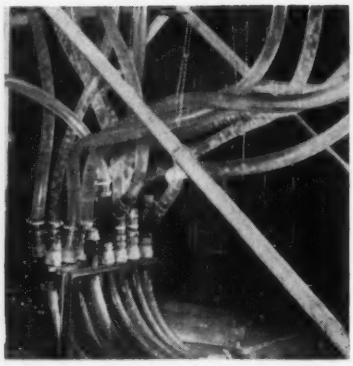
Meanwhile, the canners and concentrators are working at top speed to salvage as much as possible of the damaged fruit. In the process of blending the juices currently being recovered with other juices from undamaged fruit, the quality control departments of the concentrators will have a bigger job than any they've previously had to wrestle with. —*End*



Automatic grape handling . . .



SPEED of these metering wheels determines volume of grapes going to each can-filler.



CLOSEUP of plastic tubes and pipes that hydro-convey fruit to the dewatering screens.

KEYBOARD MAN (top right) operates central pneumatic control station regulating flow of grapes to 12 can-filling stations. From metering wheels (A), sized fruit goes into compartments of hopper (B). Movement via plastic tubes (C) follows, feeding to grape discharge and dewatering grid (D).

Cost Squeeze Eased

Applying advanced units that up operation efficiencies is Dole's very practical answer to rising costs and competition that keep shaving down the profits

SOME WHOPPING cost increases—boosting outlays for operations, equipment, and supplies—have hit the food industry in the past ten years. And keener marketing competition has added to these pressures.

To meet the soaring costs takes astute designing of advanced mechanization and smart development of new methods. Here, Dole Hawaiian Pineapple Co., San Jose, Calif., stands out as a pace-setter. With this company, even geography is a matter of cost importance, since the organization's largest plant is in Honolulu.

Development and improvement of unit operations are particularly targeted by the company. Included is statistical quality control analysis of present equipment and methods to evaluate their efficiencies. Frequently, these studies have led company engineers to the design and creation of better units for specific process uses.

Also encompassed is a continuing investigation of the equipment offered by machinery makers. And Dole management has the courage to take a "flyer" on new units not yet proved under commercial operating conditions.

The latest two company advances—one dealing with raw materials handling, the other with improved product preparation—are good examples of the company's progressive policy aimed for greater efficiency.

C. R. HAVIGHORST
Senior Associate Editor, "Food Engineering"

Here's Cost-Cutting Proof

First, on the materials handling: Assembling the five fruits that comprise fruit cocktail and salad-fruit products was originally a manual operation. It severely congested the filling station areas with racks and pans, was a high-cost labor operation, created cleanup problems, and because of delays and rough handling often impaired product quality.

Today, a number of advances have been made in assembly of these products. In fact, with the new way of handling grapes in action, only pineapple chunks and maraschino cherries are now manually handled in pans.

Dole's new grape-handling system is capable of delivering 17,000 lb. of grapes an hour to the 12 can-fillers. It reduces costs of grading and conveying, cuts personnel and equipment requirements, and augments product quality by gentle yet rapid handling.

The Coons' Pear Machine has achieved the product-preparation improvement. Developed in 1951 by Burton C. and Willard B. Coons (made by Atlas-Pacific Engineering Co., Emoryville, Calif.) it was first used commercially by Dole. Its peeling and coring efficiencies up finished-product yield approximately 8 cases per ton of raw pears.

As an added benefit, it produces whole, peeled, and cored pears that will dice into more perfect cubes—

. . . replaces this congested routine

OLD MANUAL METHOD cluttered area with racks and pans of fruit. This required more labor to supply fillers, increased cleanup work, sometimes harmed product quality.

By Mechanization

at a higher yield than halved pears formerly used for dicing.

Not yet out from under prepatent wraps (hence pictures and operating data not now available) is a newly developed Dole slicer. They call it a vastly improved unit for quartering and slicing pears.

Its outstanding efficiencies: Produces uniform slices, improving product quality; doesn't crush fruit; gives greater operating flexibility, since interchangeable slicing units may be set for number of slices per pear desired; and can handle a million pounds a day.

Getting down to the fine points, here are 10 unit operations in the new grape-handling system:

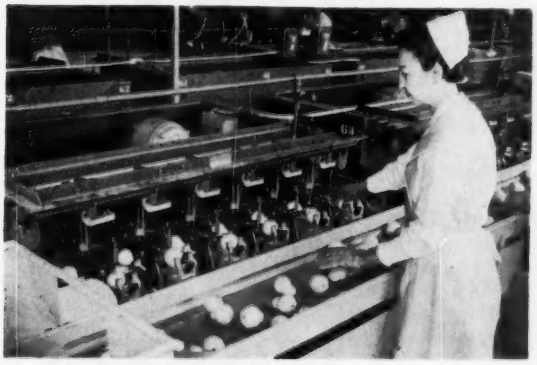
1. Rotating drums break up grape clusters. 2. Cap-stemmers remove small stems. 3. Product is inspected, with culls removed manually. 4. Fruit is hydro-elevated (15 ft.) from water-hopper to overhead flow line. 5. Dewatering graders separate grapes into sizes (No. 1, 2, and 3). 6. Each size moves along in its own "floating-bin"* conveyor. 7. They go into three 6-unit banks of 24-in. metering wheels. 8. These drop proper-size grapes into their respective water-filled compartments. 9. These feed them into plastic hose and tubing** that hydro-convey them (head pressure 3 ft.) under floor 30-to-100 ft. to dewatering screens at can-filling units. 10. Water from these screens is pumped back to a large, aluminum, water-filled overhead hopper that is divided, by expanded metal, into three compartments. These are the compartments noted above at (8). Fresh water is added here, and overflow is piped to other uses.

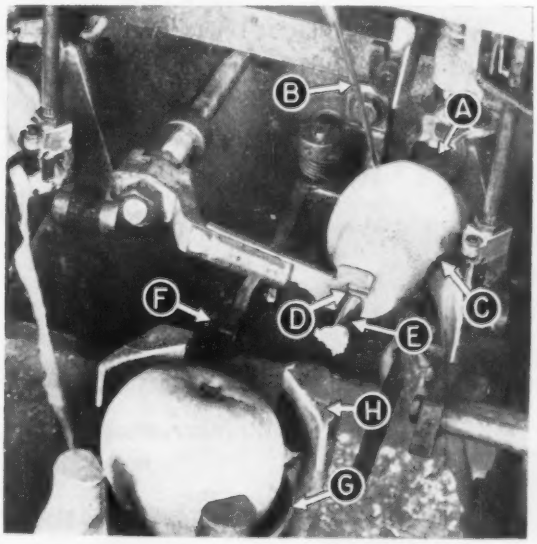
Pear Machine Points

The Coons' pear unit has a rated capacity of 6 tons per 8 hr., with recovery running 75-80% (core and peal are 15-18% of raw product).

* Dura-flexwall belts are 4 ft. wide, with 6 in. of each edge turned up at right-angles to form an accumulation trough. Thus, enough grapes are carried for a 15-min. operation period.
** Polyvinyl chloride plastic hose and Krelastic plastic tube system.

Pear yield is upped 8 cases/ton by these units





COONS' MACHINE (working view above, closeup right) peels, cores, and stems six pears at once, rate 66 pears/min. Sixty-seven units prepare 700 tons of fruit daily. Arrowed in closeup are: Stationary coring knife and holding-fins (A), water stream (B), spring-loaded peeling knife (C), stem-cutoff knife (D), coring-spindle (E), and pear-ejector trip (F). Next pear coming in rests in cup (G) flanked by "fingers" (H).

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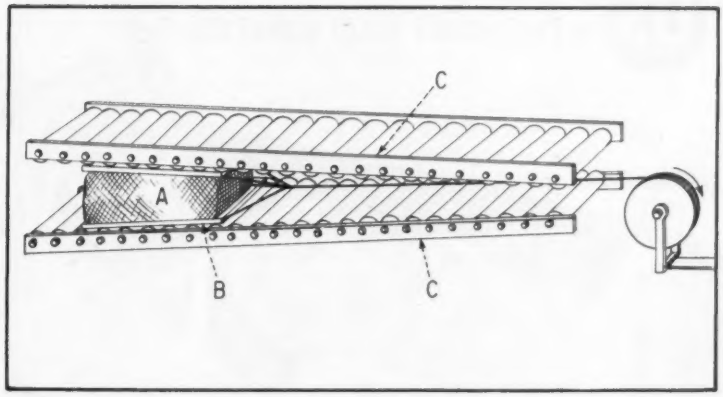
The six mechanical handling assemblies of each unit comprise a cup with four centering-fingers on a mobile, cam-actuated carriage. And the six coring-peeling and trimming assemblies are composed of: A coring-spindle having, at its base, holding fins and a stationary core-knife; a pear ejector; a spring-loaded peeling knife; and a spring-loaded stem-cutoff knife.

In action, the operator places six pears (not size graded) into the cups, and holding-fingers gently grasp and center them. Then carriages turn pears 90 deg. to a horizontal plane, next moving forward 8½ in. to accurately impale and partially core the pears on the coring-spindles. Pressure against fruit is 1 lb. (adjustable).

Then, by cam operation, centering-fingers release fruit; holding assemblies return to original positions; coring-spindle begins rotating fruit at 300 rpm; spring-loaded stainless peeling-knife contacts fruit at calyx end, and follows contour of fruit, peeling at adjustable depth (from 40/1,000 to ⅛ in.). Simultaneously, stem-cutoff knife (adjustable from 0 to ⅜ in.) cuts off end, then holds fruit firmly against holding-fins to equalize pressure applied by peeling-knife.

The stationary coring-knife now penetrates pear (1 3/16 in. to 1 5/16 in.) and in the last 1½ rpm. of peeling cycle it cuts out seed area. Holding-fins remove latter from pear when, by cam-actuation, pear is ejected from spindle by a trip. Peeling-knife and end-cutoff knife return to original positions and cycle is repeated. Peeled pears drop on take-away conveyor. —*End*

"Offer Miss Hennis a raise if she'll come back . . ."



IN NEW PRESS, pressure is applied gradually to apple "cheese" (A) on cart (B) as latter is drawn between converging conveyors (C).

Improves Juice Extraction

New type press, employing converging conveyors to squeeze pulp, extracts 15% more—and better—apple juice. Application to other fruits seen

INCREASED YIELD and better quality are two of the benefits seen resulting from a new approach to extraction of juice or cider from comminuted apples.

At the present time, juice is produced by wrapping chopped apples in press cloths, placing these "cheeses" in a hydraulic press, and squeezing the pulp. This process is slow, messy, and requires a great deal of hand labor.

Also, it fails to recover the fraction of juice which is sweetest, and highest in acid and viscosity—important factors in the product's acceptability.

This was indicated by studies made with a laboratory hydraulic press. Here, volume of juice at various stages of pressing was measured. And over 90% was extracted at relatively low (500 psi.) pressure, while a much higher pressure (1,500-2,000 psi.) was needed to remove the remaining juice.

First juice from the press was watery and thin, and contained the largest portion of tannins. Last fraction contained desirable components which influence flavor and body of the juice.

With these factors in mind, we designed a press that would gradually reduce the volume of the cake and apply increased pressure at the end of the cycle.

The unit consists of a cart that is pulled between two converging conveyors (drawing above). A "cheese" (of ground apples) is placed on the cart and pressed as it moves through the system.

Using this method, 4.1 gal. of high quality juice were produced per bushel of apples. With a standard hydraulic apple press an average yield of 3.6 gal. of juice were obtained from a sample of apples from the same lot.

Readings on a spring scale (attached to the cart tow rope) indicated that relatively little pressure was used until the cart was almost at the end of the track.

It is felt that the converging planes could be moving belts, with the apple pulp deposited continuously on the lower one. Provision would have to be made to confine the pulp during its passage.

Such a unit could probably be used for extraction of other fruit juices, such as grape and cherry, which are now being produced with hydraulic presses.

N. W. DESROSIER, D. H. BIGLEY, W. L. PORTER, and E. E. BURNS

Food Technology Laboratories, Purdue University, Lafayette, Ind.

US RUBBER LITTLE GIANT FOOD CONVEYOR BELT

Little Giant Eye-Eze Green Conveyor Belts make it easy for inspectors to spot rejects. The belt is resistant to food oils, acids, greases, to alkaline detergents and to moisture.

Only the Best Peanuts look good on Green

"We're getting more efficient inspection, now that we're using U. S. Little Giant® belts on our inspection lines," says J. W. Farriss, manager of Blakely Peanut Co. "The belt's soft green color reduces eye strain and fatigue; its smooth surface doesn't ruin the inspection girls' manicures. Everyone's pleased, from the front office to the newest employee."

Before installing Eye-Eze green Little Giant belts, sorting the bad peanuts from the good was a tough problem—tough on the inspectors, tough on the belts. Eyes would tire and smart. Belts would deteriorate rapidly due to permeation by peanut oils.

But Eye-Eze green Little Giant Belts changed all that. They are part of a complete line of food conveyor belting available (along with service by factory-trained engineers) at any of the 28 "U. S." District Sales Offices, at selected distributors, or by writing us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.

US RUBBER

Mechanical Goods Division

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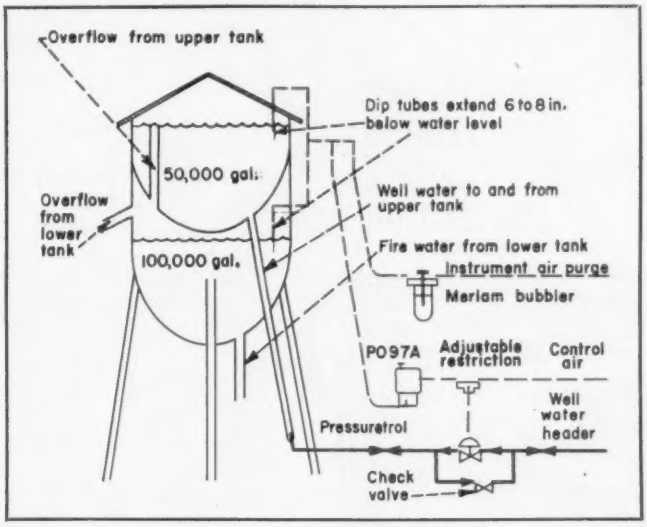
See things you never saw before. Visit U. S. Rubber's new Exhibit Hall, Rockefeller Center, New York 20, N.Y.

Single Unit Controls Water Level in Two Tanks



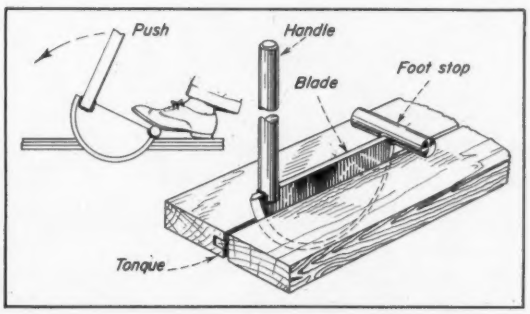
Here's a unique storage tank that's built in two sections. Upper one stores water for general plant use when normal service fails, lower one (which gets its supply from overflow of upper tank) is for use in case of fire.

To assure that water level in each section is kept close to capacity, a slightly modified purge type liquid level control system was installed (see diagram right).

Dip tubes were inserted in each section of the tank, and joined by a common line to both an ordinary air purge blubber and the pressure element of a single Honeywell P097A pneumatic pressure controller. Controller is connected to an air-to-close diaphragm valve in well water supply line which goes to upper tank. A supply of air to pressure controller completes the system.

With the dip tubes for both tanks meeting in a common line, the tube in which the greatest pressure drop exists governs the air output of the controller. If water level in upper tank falls below desired point, resulting pressure drop causes controller to shut off air to the supply valve. The valve opens and water flows until proper level is reached.

Should level in lower tank fall, resulting pressure drop again causes controller to open supply valve. In this case water will fill the upper tank and overflow to the lower one until proper level is restored—*Industrial Control News, Minneapolis-Honeywell Regulator Co.*



Tongue Cutting Tool For Floor-Boards

Installing piping and wiring beneath tongue-and-groove flooring involves cutting through tongues so that lengths of board can be raised. A common way of doing this is the laborious practice of hammering a wood chisel between the board edges.

A destructive method is to lever up one end of a board hoping that the tongues will be smashed by sheer brute force. Resultant repairs can prove expensive.

Here's a good tool (see sketch) which will sever floor board tongues without hammering or causing damage to the boards. It comprises an almost semi-circular piece of tough carbon steel with the edge bevelled and sharpened to form a knife edge. At one end of the straight part a foot-stop is welded in place and at the other end is a handle (approximately 24 in. long). This handle must be securely welded at its lower end to blade.

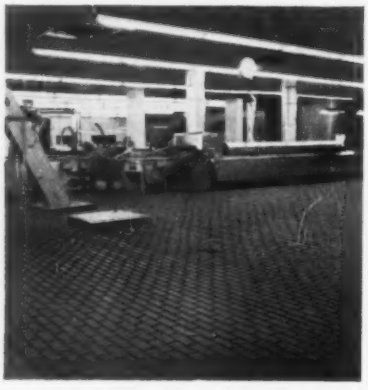
How Tool Is Used

In use, the blade is placed between the edges of a pair of boards with the foot stop resting on the floor and held down by the foot of the user (see inset). Then handle is grasped with both hands and pushed firmly forward.

Semi-circular cutting blade will then shear through the tongues on the board edges and sever them. The tool is moved along the length of a joint in the manner of a can-opener.—*Clifford T. Bower, Tool Engineer, London, England.*

Atlas

ENGINEERED FLOORS PROVIDE POSITIVE PROTECTION



. . . from bacteria and corrosion!

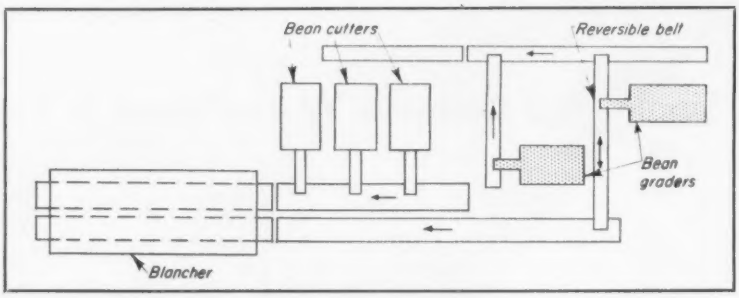
Atlas Food Plant Floors provide positive protection against a wide range of corrosives—from the most aggressive food acids to today's strongest cleaning agents. Since they are not attacked they are completely sanitary and offer no haven where harmful bacteria can collect and germinate.

Individually engineered to your exact specifications, these floors combine permanent attractiveness and wearability that eliminates costly maintenance.

For complete information write for your free copy of Bulletin 3-2.

ATLAS MINERAL PRODUCTS COMPANY
MERTZTOWN, PENNSYLVANIA

Practical Ideas



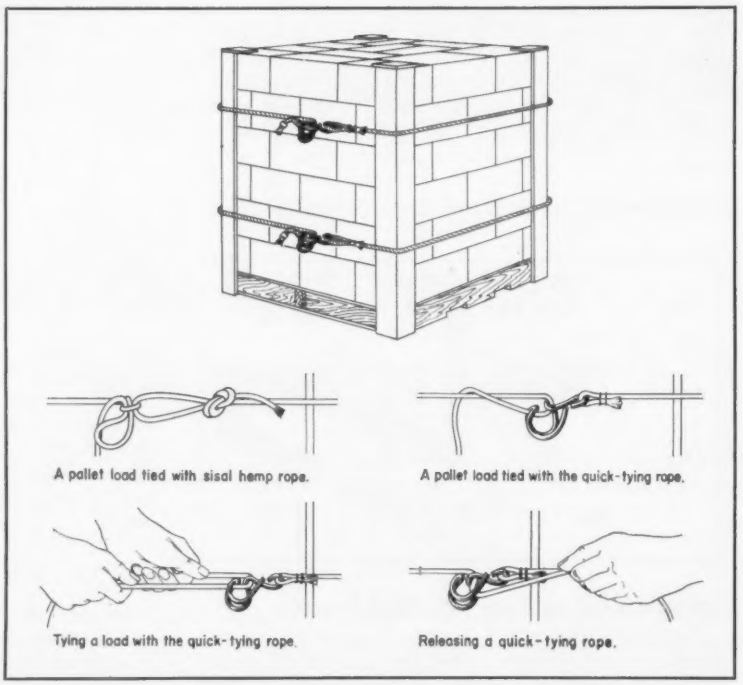
Two-In-One Bean Blancher

Limited space stopped us from having separate blanchers for whole and cut string beans, so we are making one unit do the work of two.

How? We merely split our belt (a woven wire unit, by Cambridge Wire Cloth Co.) down the center (see illustration above) and came up with two belts operating side by side.

That wasn't the end of it, though. We had to install divided members, make changes in our pulley hook-up, and rearrange out bean graders, cutters, and connecting belts (see sketch).

By the use of a short section of reversible belt, beans leaving the graders can be directed to snippers or directly into the blancher. Another belt feeds the snippers only. Thus, feed through blancher may be all whole beans, all cut beans, or one belt whole and one belt cut.—*H. W. Tilghman, Plant Manager, Shoreland Freezers, Inc., Salisbury, Md.*


A pallet load tied with sisal hemp rope.
A pallet load tied with the quick-tying rope.
Tying a load with the quick-tying rope.
Releasing a quick-tying rope.

Gaining Stability When Stacking Pallets 3-High

Four stacking irons, cut to height of filled pallet and held against corners of load by a pair of encircling rope ties will do much to augment stability.

In some cases the rope ties are effective, even without the stacking irons.

Standard method of tying with a sisal hemp rope, and a fast-action

PARTLOW MFS CONTROL
New visibility and functional good looks in a control engineered for utmost precision even under extreme conditions.

NEW FROM PARTLOW

An Industrial Temperature Control designed with the Look of Tomorrow

by RAYMOND LOEWY Associates

NEW FROM PARTLOW

A Temperature Control Created to Improve the Efficiency . . . and Appearance . . . of Any Process Equipment You Use or Manufacture

You can tell at a glance that the new Partlow MFS is like no control you've ever seen before. Created by famed Raymond Loewy Associates, it clearly marks a new high in modern good looks as applied to control design. But even more important is what lies 'under the hood'...a high-precision, mercury-actuated mechanism built to give you a lifetime of ultra-accurate and trouble-free performance.

If your products or processes require sure, precise measurement and control of temperature within the −30° F. to 1100° F. range, it will pay you to investigate now the wide variety of rugged, accurate Partlow controls for every purpose. A Partlow staff engineer is available for consultation on any application problem.

WRITE TODAY:

THE PARTLOW CORP.
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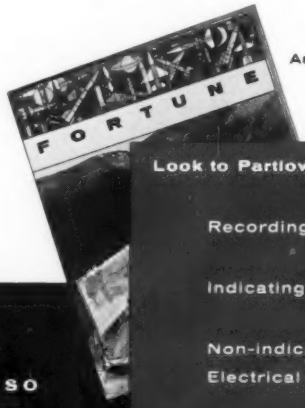
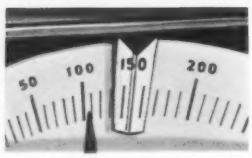


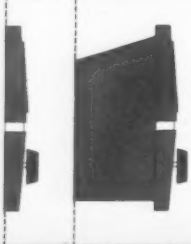
As advertised in Fortune

NOW, ONLY IN THE NEW PARTLOW MFS CONTROL, SO MANY ULTRA-NEW AND ULTRA-PRACTICAL FEATURES:



Pointer magnification with parallax sighting for closest possible settings!

Dial calibrations, background and pointers color-contrasted for maximum readability—even at a distance.



Flush or Wall mounting, with no additional brackets or hardware required.

Reinforced polyester plastic in a smooth semi-gloss gray finish . . . strong, lightweight, easy to clean . . . won't rust, won't crack under extreme temperatures.

Look to Partlow when you need:

- Recording Controls
- Indicating Controls
- Non-indicating Electrical Controls
- Non-indicating Mechanical Controls
- Limit Controls
- Recording and Indicating Thermometers
- Combustion Safeguards
- Timers

PARTLOW

Pioneer in Mercury-Actuated Temperature Controls

method that saves time when reinforcing and when untying loads, are shown above. Use of a specially-twisted fitting does the trick.

Advantages of using the supports are that they don't require hardware on the pallet, and they may be placed on any size pallet.

However two disadvantages are encountered. One is that they must be used with certain size cartons that can be stacked to within 1 or 2 in. of the endplate. Also, careful stacking of cases must be practiced in order to insure that the irons will be exactly vertical.

Use of tubular metal tier racks overcomes the disadvantages. And high-stacking, even with compressible merchandise, can be safely achieved. Welded foot plates snap on conventional pallets to convert them into pallet-racks.—*"Agricultural Marketing," publication of USDA, and "Ideas for Better Warehouse Operations," publication of National Association of Refrigerated Warehouses, Inc., Washington, D. C.*

Aid Produce Transfer

Two devices—a ball hitch and flexible hopper—work together to decrease distance produce, such as potatoes, drops when moving from one conveyor to another.

The ball hitch holds the two conveyors together at that point. Flexible hopper bridges gap between, bringing them closer together.

An ordinary trailer ball and socket serves as the hitch. Used as a pivot point, it allows the conveyors to swing both horizontally and vertically.

Flexible hopper comprises a frame of $\frac{1}{2}$ in. round iron or $\frac{3}{8}$ in. black pipe and $1x\frac{1}{8}$ in. strap, with two

Let's Have Your Ideas

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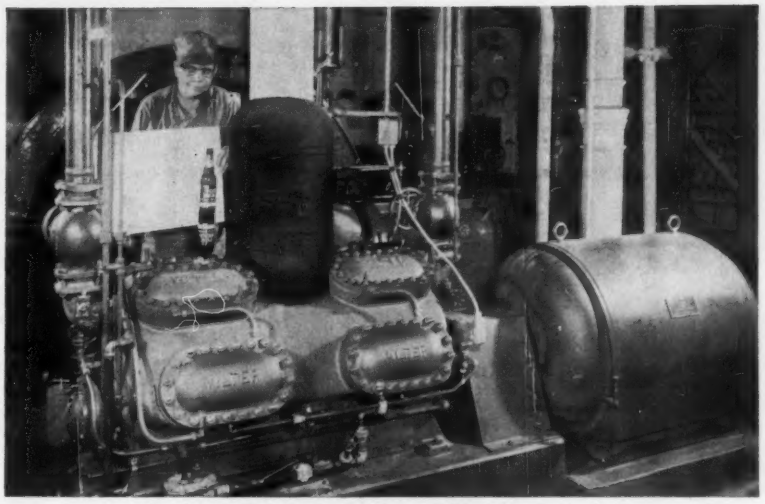
Just send us the facts about your idea and its application. And include a free-hand sketch or snapshot to show how it works.

We'll do the finished writing and drawing for you.

Send your idea today, before you forget. Address it to Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.—The Editors.



This photograph was taken with two Fox Head beer bottles balanced on the compressor head of the Vilter unit while running.

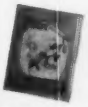
Smooth-running
VILTER COMPRESSORS
guarantee long life and economical operation

Proof is in performance. Recently, Vilter's new 16-cylinder VMC ammonia compressor underwent full performance tests at Fox Head Brewery, Waukesha, Wisconsin. Said Mr. T. Byrne, Fox Head Maintenance Engineer, "This new Vilter compressor ran so smoothly that two balanced beer bottles, one on top of the other, stood steady on the compressor head during the test run." After being in continuous operation during the past several months, this Vilter compressor has performed beyond expectation. The Fox Head people are very happy with it.

The smooth, steady operation of this Vilter compressor guarantees long life, economical, efficient operation. It will more than pay for itself in extra years of service. In the background, still doing full duty, is a Vilter duplex horizontal compressor built in 1934. Typical examples of Vilter superiority—smooth operation . . . long life.

Why don't you familiarize yourself with quality Vilter equipment? Write for Bulletin 308—"Vilter Equipment for the Brewing Industry."

Write for these helpful bulletins to The Vilter Manufacturing Company, Dept. E-713, 2217 S. First Street, Milwaukee 7, Wisconsin.



Bulletin 308 Vilter Equipment for the Brewing Industry

Bulletins 617 & 604 Vilter VMC Ammonia Compressors

Vilter®
REFRIGERATION and AIR CONDITIONING

THE VILTER MANUFACTURING COMPANY, Milwaukee 7, Wisconsin

Air Units • Ammonia & Freon Compressors • Booster Compressors • Baudelot Coolers • Water & Brine Coolers • Blast Freezers • Evaporative & Shell & Tube Condensers • Pipe Coils • Valves & Fittings • Pakice & Polarflake Ice Machines

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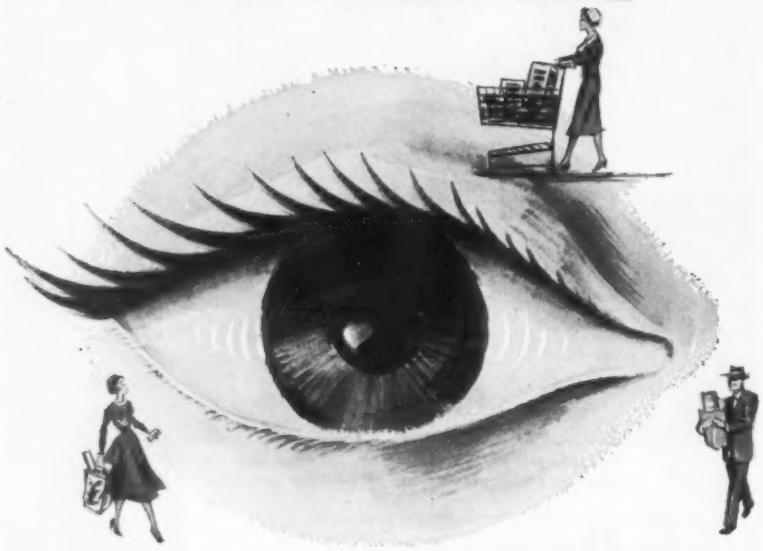
CATCH THEIR EYE



with colorfully PRINTED PATAPAR® WRAPPERS

Wet-strength, grease-resisting wrappers of Patapar Vegetable Parchment do more than just protect the product. They add glamour and sales appeal!

Exquisitely printed in eye-compelling colors, Patapar is outstanding for packaging butter, ham, bacon, cheese, margarine, shortening, poultry, sausage, nursery stock, flowers and many other products.

Our plants are completely equipped for printing Patapar in full color—by letterpress or lithography. Inks used are color-fast and NON-TOXIC.

We will reproduce your present wrapper design, or we'll create a colorful new design for you with any wording you wish. No charge for typesetting.

Want us to show you? Just tell your requirements and send us a sample of your present wrapper.

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Vegetable Parchment
HI-WET-STRENGTH · GREASE-RESISTING

OTHER PATERSON PRODUCTS
*PATAX waxed paper
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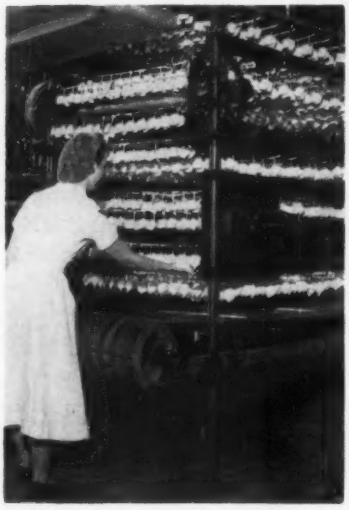
HEADQUARTERS FOR VEGETABLE PARCHMENT SINCE 1885

sides and the back constructed of 3-ply belting. Two springs are fastened from "T" iron on back of hopper to plates on corresponding sides to maintain its shape. These hold the sides so that either can flex separately, or both sides and back can flex as a unit.

This flexibility, together with the pivotal position of the ball hitch, makes the equipment adaptable to most handling needs such as transfer from truck to bin, or in and out of bins.—Agricultural Marketing (USDA, Washington 25).



Belts Recover Drippings

To catch icing drippings from cookies as they are conveyed on trolleys during drying, Sunshine Biscuit Co., Dallas installed endless conveyor belts under each of its six lines (photo). Their sole purpose is to catch the drippings and return them to the dipping vats.

Used are 38-in. wide, 3-ply Koroseal food handling belts (B. F. Goodrich Ind. Prod. Co.). They travel about 20 fpm. and run intermittently for 8-hr. a day, five days a week.—*FE Staff.*

Solves Pumping Problem

If you pump products like cake batters and have piston maintenance problems, switch to Teflon.

Like others in the baking field, we used stainless steel pistons and cylinders to resist the corrosive nature of cake batters. But friction between the moving parts wore the pistons so

WHAT IS PRO-80?

Economical Source of Concentrated Protein— with many processing bonuses

More and more food processors recognize the fact that "Protein Enriched" on their food label means greater sales volume. General Mills Pro-80 Vital Gluten is 80% wheat protein (m.f.b.). It adds sales stimulus to existing foods, helps create protein-rich premium-priced products.

Pro-80 can assist in processing of food products in many ways. For example:

Pro-80 serves as a binder in cereals and meat products.

Adds "bite" to macaroni and spaghetti.

A meat substitute in vegetarian products.

Strengthening agent in pretzels.

Continuous dough-forming agent in yeast-raised baked goods.

Liquid Absorber in gravies and meat pies.

Perhaps you can use Pro-80 Vital Gluten to good advantage in your products. You'd do well to have your product development people look into it. To get the facts on how Pro-80 can help you, send the coupon below.

SPECIAL COMMODITIES DIVISION

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General Mills

Get more facts fast
SEND COUPON TODAY

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Yes, I'm interested in knowing how Pro-80 can be added to bread ☐, health foods ☐, macaroni products ☐, puddings ☐, cereals ☐, baby foods ☐, other_____

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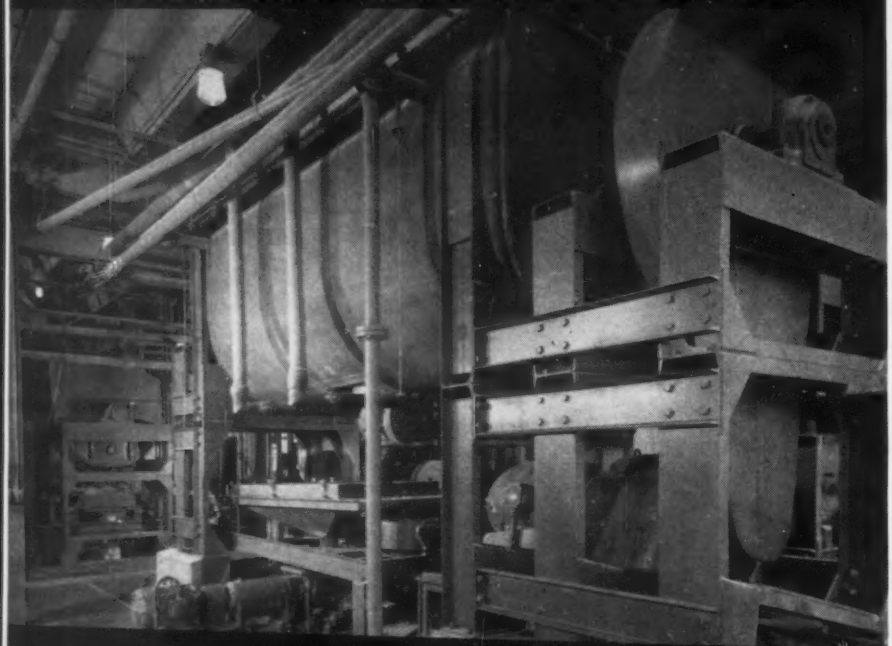
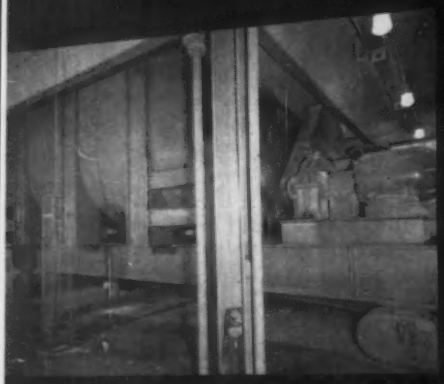
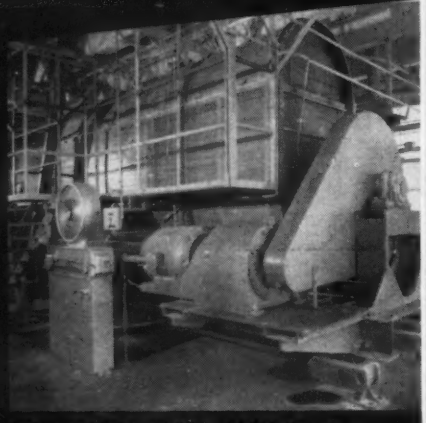
DAY Blender (Cooler), 10,000 lbs. capacity, discharging into one of two DAY Ro-Ball Sifters.



DAY installs blenders, sifters, acidifiers at CLINTON



World's largest mixer, built by DAY and used for blending dextrin, 60,000 lbs. capacity.



DAY wood tank acidifier, 10,000 lbs. capacity, scale mounted.

Clinton Corn Processing Company, a division of Standard Brands, Inc., Clinton, Iowa, has used DAY process equipment for years and has found it to be dependable and economical. Therefore, when equipping its new, modern plant, DAY blenders, sifters, coolers and acidifiers were again specified and installed.

If you make DAY process equipment your *first choice*, you, too, will produce a better product at real savings. Remember:—"Every day is a great day when you use DAY equipment". Why not write for a catalog now?

The J. H. DAY Co.
Division of The Cleveland Automatic Machine Co.

SERVING THE PROCESS INDUSTRY SINCE 1887

4924 BEECH STREET
CINCINNATI 12, OHIO

Practical Ideas

badly they had to be replaced every three weeks, causing expensive downtime.

We licked the problem by machining pistons of Teflon, which can be purchased in almost any size rod or square.

These pistons have been in operation for more than a year with no signs of deterioration. And other moving parts in our batter system have been replaced with the plastic with excellent results.—*J. Weaver, Chief Engineer, California Baker Products Co., Bell, Calif.*

Driver Reminder

For safety and preventive maintenance, it is important that drivers of delivery trucks turn in daily reports on needed repairs. But they often forget to do this.

To remind its drivers of the report, Fuchs Baking Co., Miami, placed the mail box (photo) directly in front of the cab door when the truck stops to be gassed.—*W. J. Holmes, Miami, Fla.*

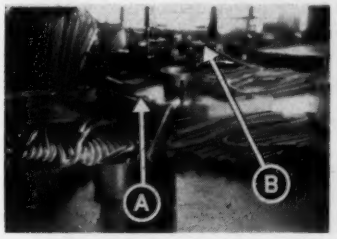
Cheese-Whey Sampler

In taking samples of cottage cheese whey for acidity tests, the usual procedure is to dip out a pocket in the curd and allow the whey to seep in. But it is frequently necessary to filter the whey to obtain an accurate sample.

Recently I was looking at a potato ricer and it gave me an idea as to an improved sampling method. I wrapped a paper towel around the ricer and fastened it snug with a rubber band.

The sampling device can be placed in a coagulated vat of cheese where it settles by its own weight. In about a minute, enough whey has passed through the towel to provide

a filtered sample for testing.—*Cyrus Mattson, Production Superintendent, Old Home Creameries, Moose Lake, Minn.*



Device Speeds Feeding Of Frankfurter Links

Installation of a caliper to simplify check-weighing of frankfurters at Wisconsin Meat Products, Milwaukee, made it necessary to speed up alternate feeding of stuffed 50-ft. lengths of casing to a pair of linking machines. Operation used to be difficult and time-consuming. Operators had to reach over an 8x9 ft. stuffing table to gather the 50-footers and hand-feed them to linkers.

Solution was a 2-way air valve and air-cylinder (A) that swings 50-ft. lengths of franks from one linker (B) to another (not shown). Stuffing machine operator flicks the valve that activates the cylinder.

Operating at a pressure of 40 psi., cylinder drives a gear track that meshes with a circular gear to swing a vertical U-shaped polished aluminum plate (¼x4x28 in.) 40 deg.

A spring, attached to the plate, slows it up at the end of each stroke so that the stuffed casing is not thrown against the table ahead of the linking machine.—*FE Staff.*

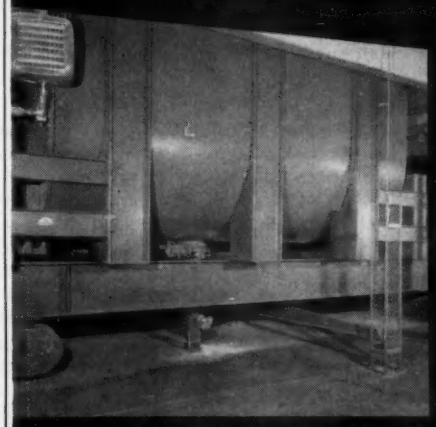
Safety Hints For Drivers

Three to six in the morning are the usual working hours for many milk route salesmen and, as these are the most hazardous, T. E. Russel, safety engineer, McArthur Jersey Farm Dairy, Miami, urges drivers to keep trucks on right side of street when making deliveries.

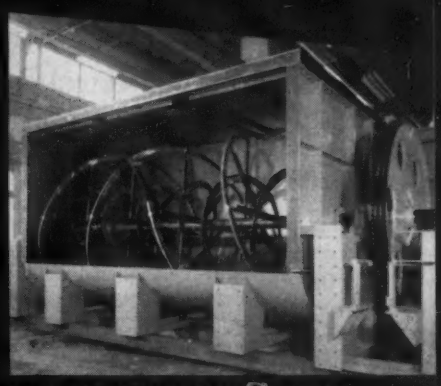
Another worthwhile suggestion is that, if an employee carrying glass bottles finds himself slipping on a wet street, he should throw the bottles away from himself to avoid falling into broken glass.—*W. J. Holmes, Miami.*

DAY'S largest blender, drive end view. Mixes a carload at a time.

DAY builds world's largest mixer for CLINTON



The world's largest blender built by DAY and installed at Clinton's new plant.



Interior of DAY'S largest blender, showing one of the two 9' agitators.

The world's largest mixer is part of a big installation of DAY equipment recently installed at the Clinton Corn Processing Company, a division of Standard Brands, Inc., Clinton, Iowa. It is so large that it can blend 60,000 lbs. of dextrin (one carload) at one time, assuring absolute uniformity of these huge batches.

DAY mixers, blenders, sifters, roll mills, and laboratory equipment are found in many major process plants, helping produce products better, faster and more profitably. You, too, will improve quality and cut costs when you use DAY process equipment. Write for information.

SERVING THE PROCESS INDUSTRY SINCE 1887

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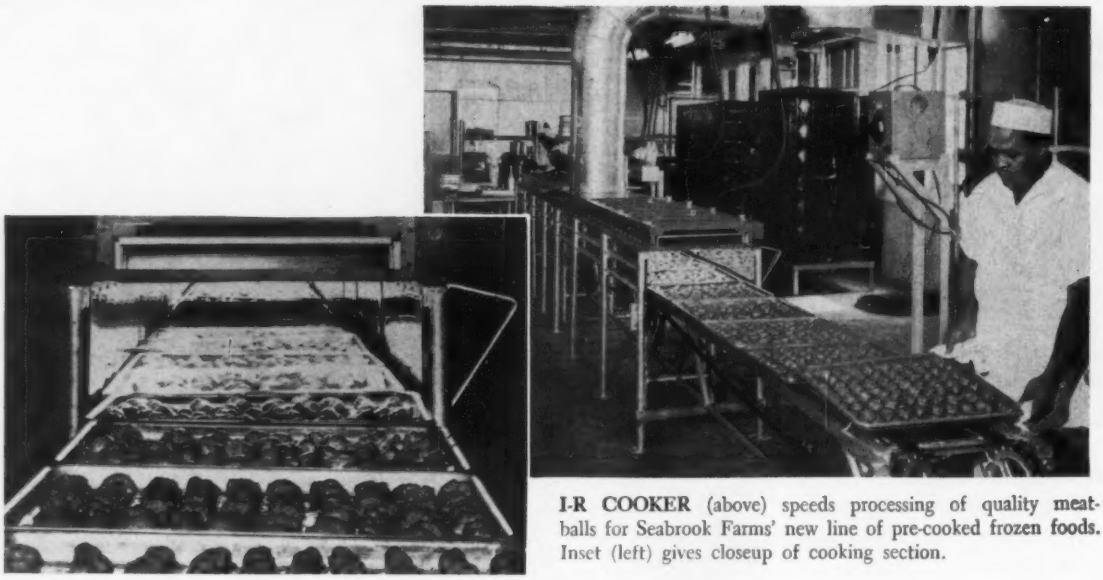
The J. H. DAY Co.
Division of The Cleveland Automatic Machine Co.



I-R COOKER (above) speeds processing of quality meatballs for Seabrook Farms' new line of pre-cooked frozen foods. Inset (left) gives closeup of cooking section.

'Infra-Red' Processing

New quartz lamps open door to top-efficient cooking, baking, drying.

'COOKING WITH LIGHT'—actually infra-red radiation—is particularly appealing, for in contrast to conventional heat-transfer processing, I-R waves are absorbed by the product to produce internal heat.

Thus foods cook faster, retain more moisture, and are under instant heat control. Moreover, I-R processing permits important savings in floor space, eases overall sanitation, and eliminates combustion products, which might impair product quality and uniformity.

In fact, such items as sugar, macaroni products, grated codfish, potatoes, wheat germ, bread crumbs, and various produce, have been successfully handled by radiant dryers. Not cookers but *dryers!*

Cooking with 'infra-red' is far more difficult than drying and, until recently, most attempts were unsuccessful. Many failures resulted from misunderstanding of basic I-R properties and how to apply the waves to specific foods. Lack of a high-energy source permitting convenient mounting was another problem.

However, recent development of quartz-envelope lamps has processors eagerly re-evaluating the I-R technique.

The new lamps, which produce temperatures to 1,500F., have tubes or bulbs of heat-resistant quartz rather than glass. Since quartz softens at 3,000F (as against 1,000F for heat-resistant glass), it is possible to enclose the filament in a small-diameter tube and operate the unit at very high ambient temperatures. Mounting several lamps in a small space achieves much higher concentrations of radiant energy.

And very important to successful food processing is the fact that these units operate at temperatures sufficiently high to generate the shorter I-R waves vital to proper color development.

Process Factors

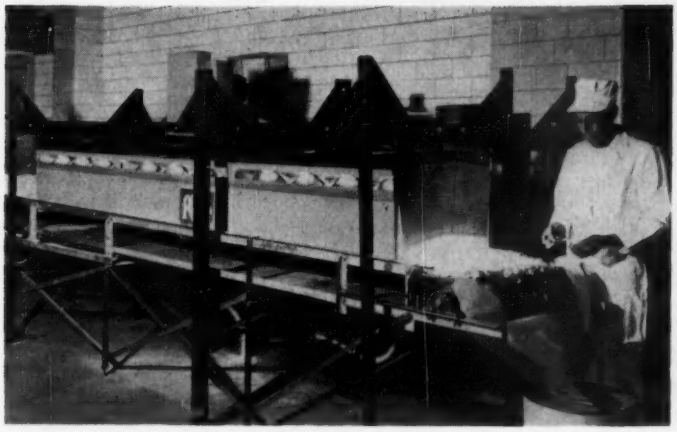
We will detail a number of I-R applications, and explore other potential uses. But first let us consider the basic wave properties for successful processing.

Briefly, radiation is transfer of energy by electromagnetic waves of varying length. I-R heat rays ranging between the very long radio waves and the visible portion of the spectrum. These waves differ only in amount of energy contained per unit wavelength. Otherwise, their essential qualitative properties are identical.

Successful radiant cooking requires that both the quality and quantity of energy used be in proper balance. Only then can desired product appearance, texture, and flavor be obtained.

Compared with cooking, drying is a simple operation whose sole objective is removal of water, usually without changing the product in any other way. Cooking, however, alters foods both physically and chemically (preferably with minimum moisture loss). A few items, potato chips for example, do require simultaneous cooking and dehydration.

In view of the above, it would seem obvious that the radiant source selected for a cooker must emit much of its energy in those particular wavelengths useful to a given product. Yet this prime point has often been disregarded in equip-



2-MINUTES under these 1,000w. globular I-R lamps drops moisture content of this hygroscopic exploded-cornmeal confection to below 1%, thus achieving desired crispness for packing. This oven, employed at Maize Industries of Chicago, has 24 lamps that combine high-speed production with close temperature control.

Is Really Catching On

Wave properties, 12 I-R applications, 10 potential uses

ment design. Also, physical laws of radiation and absorption, particularly as they relate to thin food layers, have been ignored or misapplied.

If radiation is too penetrating, as in microwave heating, the product will be overcooked and unattractive. On the other hand, relatively short waves have limited penetrating power, but can cause surface scorching before cooking is complete.

A food's color is obviously important. Steamed hamburger, steak, or chicken may be well cooked, but look exceedingly unappetizing when compared with similar broiled or fried items. The difference in appearance is due to surface color. In radiant cooking, long waves can cook the food, but only the shorter waves (preferably below 2 microns) are effective in developing color.

Thus, radiant heating elements should operate at color temperatures ranging 2,200-3,300F. to produce the necessary short wavelengths.

Although cooking may be defined as 'preparing food by heat,' this oversimplification gives no idea of the complex changes occurring in the product. Of course, there is a simple transfer of heat and rise in temperature. But this is accompanied or followed by: Denaturation or polymerization of proteins, which alters texture; moisture loss; swelling or breakdown of cell walls and carbohydrates; and critical changes in color, odor, and flavor.

Further, since heat transfer usually takes place in air, water, or hot oil, the transfer medium is a definite factor in determining final-product characteristics. Food components may be leached, as in boiling, or there may be absorption of cooking medium, as in deep-fat frying.

Some foods cooked by radiation contain only water, protein, and fats. Braising of meat and cooking of hamburgers are typical of processes relatively easy to control with respect to product appearance and degree of cooking.

However, many other items (fried chicken, fish sticks, etc.) are covered with batter and breading having complex functions: They give foods a relatively waterproof coating (particularly when treated with oil), impart new flavors (salt, spices, etc.), and are responsible for most of the surface color.

Fish sticks, cooked identically but with different batter compositions, will have colors ranging from pale honey to the darkest caramel. Thus, batters and breadings must be carefully balanced to produce desired flavor and color.

Proteins and fats alone may brown due to oxidation, polymerization, or actual carbonization (burning), but these reactions are relatively slow. However, if any reducing sugars contact a protein, rapid browning results (Maillard reaction). Any carbohydrate will yield reducing sugars when heated, even if none are present originally. Such sugars generally are added to batter formulations to accelerate browning.

A word of caution at this point: In converting to a new type of cookery, such as changing from deep-fat frying to radiant cooking, expect the product to emerge with new flavor and/or appearance. The effects may be minimized by formula revision. Or the new process may be so modified that the old ingredients yield a reasonable facsimile of the original item's appearance, texture, and flavor.

At best, this procedure is risky for a product well established in the consumer market. Such changes are quickly detected and may be disliked even if they improve the item, as when oil rancidity is decreased. It might be wise to reserve radiant processing for foods about to be introduced.

In any case, actual changes in product characteristics must be determined empirically. Although the physics of the process can be computed exactly and the engineering factors approximated relatively well, never assume that radiant cooking can be simply substituted for any other type of cookery. Without good experimental data, chances of success are practically nil.

I-R Fundamentals

What happens to energy absorbed by a food during radiation?

Molecules of any absorber are held together by energy bonds which can exist at various discrete levels. Bond energy is increased by absorption in finite amounts at frequencies (wavelengths) corresponding to the molecule's absorption spectrum.

If enough energy is thus absorbed, the molecule may be disrupted at the bond. Then, its component

You can get practical infra-red units right now—to efficiently handle fish, poultry, meats, baked goods, and vegetables

radicals are free to recombine chemically in a new fashion, which leads to polymerization, depolymerization, and flavor change. At an intermediate absorption level, this increased bond energy may be transmitted to other molecules by impact.

Finally, absorbed energy may be re-radiated, either at the same frequency at which it was absorbed, or at a lower frequency (longer wavelength). This is particularly important because much of the energy absorbed from a radiant beam by water vapor, metal encasements, and the product itself is re-radiated in a degraded form (lower energy).

With an energy spectrum having its peak at 2 microns, re-radiated energy may have its spectral peak at the 25-micron level. When considerable absorption and re-radiation occur, a system rapidly approaches the point where residual energy is ineffective so far as absorption by molecular bonds is concerned. Heating then results only from the molecule's absorbed kinetic energy.

In short, radiation heating degrades to convection and conduction heating. Since gases in the air (including water vapor) have a finite infra-red absorption, and re-radiate this energy at a long wavelength, there will always be some conduction and convection heating in a radiant cooker (unless a vacuum system is employed).

Therefore, even a radiant oven should have encasements and, engineering-wise, be considered as a combined radiant and conventional heating unit.

When a radiation beam traverses a space containing particles, the latter reflect at random those wavelengths of energy identical with the particle's diameter. This is important because, in a radiant cooker full of moisture droplets or smoke particles, the decrease in radiation reaching a product will be out of proportion (far greater) to the weight of particles.

A properly designed unit has positive air circulation so that scattered particles are removed as quickly as they are formed. If air is recirculated, it should go through a filter. If oil is sprayed as a mist, it should be kept out of radiant-beam path.

Now for a closer look at the quartz I-R lamp:

There are just two types of near infra-red (high-temperature) sources —globular and tubular. The former have been widely used where (1) they are so far from the object being heated that overlapping rays from different bulbs merge to provide a uniform field, or (2) a uniform field, free of hot spots, is not needed.

Disadvantages of these lamps are that high-temperature operation requires special bulb sockets and wiring, and any vibration tends to loosen the bulb from the socket. Thus they are being displaced by the tubular type, especially where a uniform field is needed relatively close to the source.

Tubular I-R lamps (such as General Electric's T-3) provide up to 150 kw. per sq. ft. Similar units will be available from Westinghouse Electric Corp. and Sylvania Electric Products, Inc.

Quartz envelopes employed are $\frac{3}{8}$-in.-dia. tubes ranging in lighted lengths from 5 to 50 in. The actual radiation source is a coiled tungsten filament attached to special quartz-to-metal seals at the end of the gas-filled tube. In normal operation, tube life should average more than 5,000 hr.

Temperature of the seals must not exceed 650F. or they will crack. Control can be accomplished by proper tube-holder design, or much more cheaply by constructing the oven so that lamp seals are outside the walls. In the latter case, forced-air cooling should be used.

Because of the seal problem, lamps must be operated in a horizontal position. Of course, banks of lamps may be run at any angle so long as the two seals on each lamp are at the same level.

Starting characteristics of quartz lamps are similar to those of other filament units, the inrush current being several times the operating figure. Circuit breakers and other equipment rated for use with incandescent lamps are usually satisfactory. But where inrush current is a problem, it can be reduced by placing a thermistor in series with the lamp.

When smaller lamps are operated in a typical circuit, current drops to its normal value in about 1/3 sec., and in $\frac{1}{2}$ sec. for lamps rated at 2,500 and 5,000w. In constant-current circuits, lamps reach 80% of normal wattage in about 2 sec., and decrease at about the same rate when current is cut off.

For most food uses, however, constant-voltage characteristic is far more useful in producing the short-wavelength radiation required for color development.

As a general rule, and particularly when dealing with batter-coated or breaded items, it is better to operate overvoltage than undervoltage. This does not apply, however, when using incandescent lights having most of their radiation in the visible portion of the spectrum.

Here are 12 ways in which I-R is being used to speed production and improve quality:

12 I-R Applications

1. Frying fish sticks, etc.

In contrast to deep-fat frying, in which oil is also used as a heat-transfer medium, it's possible to minimize fat absorption when cooking with infra-red.

Such a cooker (J. W. Greer Co.) consists essentially of a conveyor section, oil sump, radiant lamps, blowers, and hoods.

In operation, product first passes through a curtain of cooking oil, then under a bank of radiant heaters. After being turned over, it continues under a second curtain of oil and, finally, under another bank of lamps.

Oil passes a screen atop the sump, then is recirculated by pump to slotted pipes over the belts.

Two banks of lamps are mounted on an angle-iron frame so that their height above the conveyor is adjustable. There are 18 lamps (3,800w.) in each bank, providing a total of 136.5 kw. The frame is suspended from the ceiling, and the conveyor section may be removed for easy cleaning.

A centrifugal blower exhausts fumes and excess hot air through two hoods. Sides of the unit are encased in steel covers lined with disposable aluminum foil as a further aid to sanitation.

2. Deep-fat frying breaded chicken.

Tests show that breaded, cut-up chicken can be deep-fat fried with a greater yield. Furthermore, product is juicier tasting and picks up less fat. Oven capacity: 2,000 lb. per hr.

The system involves a 2 to 3 min. deep-fry in 350F. peanut oil, followed by a 12-min. exposure in an I-R oven. Latter processing raises the item's internal temperature to 180F. to complete the cook. In addition, the breading is firmed and given extra surface browning.

Employed is a 54-ft. horizontal air-injection oven with 325 T-40 lamps (500w.) and 6 blowers (2,000 cfm.). Breaded chicken parts are conveyed through the oven on an 85-ft. wire-mesh belt traveling at 4½ fpm. An extra length of belt serves to partially cool the chicken coming out of the oven.

3. Browning roast beef hash.

It's easy to go automatic in braising (to a nice brown color) beef for canned hash at 1 ton per hr. Here's how it's done:

Ceiling-suspend a 7-bank I-R oven (5x51¼ ft.) over a caster-mounted, chain-driven rod-type conveyor (4½x60 ft., rods on 4-in. centers). Then install 236 lamps (1,000w. T-40's) and a percentage timer in each bank for flexible temperature control. And employ plenum-type ventilation to blow 2,000 cfm. of air through each bank.

Load meat into stainless-steel pans (3x18x52), place on conveyor, and run through oven (on an 18-min. cycle) to brown the surface to about 500F.

At end of production, conveyor can be rolled out of oven and steam-cleaned. Operator then walks into oven to clean it, later momentarily turning on heat for drying.

4. Braising ham slices.

With ½-in.-thick ham slices, same oven system browns only one side of slice to 500F. surface temperature in 18-min. cycle. Braised ham slices can then be cut into chunks and packed into cans along with beans for thermal processing. Yield is higher (less moisture loss) than when braising in convection-type oven.

5. Broiling hamburgers.

Same oven can be used to braise ½-in.-thick hamburgers to 500F. surface temperature in 7-min. I-R braising produces a higher-quality hamburger without the fat absorption typical of conventional fat-braising.

6. Pre-cooking sausage links.

Surface browning and heating of Brown 'N Serve sausages to 138F. internal temperature has been accomplished with 2-stage I-R heating in a 3 to 5 min. cycle. For half the time, sausages are exposed to high-intensity heat (1,000w. lamps) for surface-browning, then held at low-intensity heat (250w. lamps) to check browning and to achieve required internal temperature.

7. Cooking sliced yams.

Slices ¼ to ⅜-in. thick are first given a 5 to 13-min. blanch at 180-200F., then sprayed with vegetable shortening. Product (on trays) is next conveyed through a horizontal I-R oven 47 ft. long. Latter has 175 T-40 lamps (1,000w.) mounted about 1 ft. above the steel-belt conveyor, which has a variable-speed drive. Oven top is backed with gold-plate reflectors.

Cooked slices go to a forced-air cooling tunnel. Then they are candied (packaged with a layer of sugar), and frozen in foil-lined cartons.

Such yams are re-heated by the housewife to melt the sugar layer and produce the 'candied' slice.

8. Removing moisture from icing.

Install an I-R oven and you have a continuous method of drying icing on oatmeal cookies so that they're ready for cooling and packaging. In contrast, conventional processing entails 24-hr. rack-cooling, which takes a lot of floor space.

I-R does the job in a 6-bank oven (4½x126½ft.) with 600 T-40 lamps (500w.) and a dozen 2,000-cfm. blowers. Power consumption is 108kw., although oven can take a 300kw. load. Also employed is a horizontal, air-injection type ventilator, and each bank is equipped with an input controller.

The wire-mesh conveyor running through oven is 4x300ft. Belt speed is 18 fpm.

The system handles 1,600 lb. of cookie base, and drives off 121 lb. of water from 480 lb. of icing per hr. Moisture contents of icing in and out of oven are 32 and 10%, respectively. Cookies then go to a 70F. air-conditioned room to cool the icing prior to packaging.

9. Drying macaroni (short-cut)

A 12-min. I-R drying system (FE June '55, p. 58) lops 18 hr. from conventional drying time and saves considerable floor space.

Machine-extruded elbows (1,000 lb. per hr.) are hopper-fed onto a forced air (140F.) conveyor that transfers them onto a cascading series of three vibrating screens. Above each screen is a battery of I-R lamps that toast-dries the macaroni to 230F. before it is discharged onto a cooling-packaging conveyor.

10. De-watering wax-dipped spuds.

It's smart to protect potatoes by washing, treating with anti-sprouting agent, and wax-dipping. But excess water must be quickly and continuously removed before bagging.

Here's how 40,000 lb. are dried hourly by I-R:

They dry for 2½ min. on a 5¾x40-ft. roller-type conveyor traveling through a 6x32-ft. oven at 13 fpm. Oven is of the horizontal air-injection type. It's equipped with 96 quartz T-3 lamps (1,600w., ⅜-in. tubular type) and four blowers (two 1,200 and two 2,000 cfm.). Connected load is 150 kw.

11. Dumping drums of shortening.

Practically all of the shortening can be released from a drum in 4 min. with use of a circular-type I-R oven. Unit employs 48 G-30 lamps (500w., ⅜-in. globular type).

12. Pre-heating glass jars.

Jars are pre-heated to 180F. on their way to the filler by passing a bank of I-R lamps. Process cheese at 180F. is then filled into jars without danger of thermal shock and breakage.

I-R heating abolishes use of steam, also the need to invert and drain water from jars.

10 Potential Uses

No doubt about it, I-R has many other food-industry applications.

Consider the following ten laboratory-tested techniques. Perhaps they'll give you a tip or two.

1. Prevent the mashing of vanilla wafers during packaging by reducing moisture content from 7 to 3½-4%.

2. Improve appearance of ¼-lb. packages of cheddar cheese and check sticking to wrapper by slightly "rendering" butterfat on surface of product.

3. Facilitate grinding of bread into crumbs. This is done by drying the slices from 31 to 3% moisture—6 min. with 1,000w. lamps and 9 min. with 500w. bulbs—and they're brought to desired color. Conventional method in one plant calls for 3 days' drying in a 125F. room.

4. Speed drying of ground chicken meat, from about 50 to 3% moisture, with little color change. Product is put through an I-R oven in 30 min., under 500w. lamps and with 500 cfm. of air.

5. Toast coconut macaroons (top and bottom) by conveying on wire-mesh belt through I-R oven (1,000w. lamps) in 2¼ to 3¼ min.

6. Bake and brown cake batter (top and bottom) and raise to desired height by I-R heating for 8 to 12 min. to internal temperature

of 160 to 180F. Horizontal sandwich-type tunnel oven employed is gas-fired and provides a 23-min. bake at 375-400F. Lamps (250w. R-40's) are on 4½x6-in. centers on top and 6x6-in. centers on bottom of oven.

7. **Dry almond paste-sugar mix** to facilitate handling and packing without danger of product caking. A ¼-in. layer of paste mix is placed on pans which travel past 500w. lamps for 3 min. and past 125w. lamps for 3 min. Air flow is 100 fpm.

8. **Baking loaves of white bread** (16 oz.) in metal and Pyrex pans in 19 min. In the small lab oven employed, the top lamp was off for 6½ min. and on for 12½ min. Loaves started to brown in 3½ min., and the bread was baked to 205F. Conventional gas-fired oven takes 23 to 24 min. to bake at 450 to 475F oven heat.

9. **Pre-cooking bacon strips** (1,200 per min.) by frying in I-R oven. Fried strips can then be packed, six to a foil pouch, and conveniently "popped" in a toaster before serving.

10. **Baking and browning** baking-powder biscuits by heating 4½ min. on 20-gage aluminum plate with 250w. lamps (5x6-in. spacing).

For their assistance in preparing this article, FE's staff is grateful to Mr. L. E. Goble of The Fostoria Pressed Steel Corp., Chicago, and the Research & Development Dept. of J. W. Greer Co., Wilmington, Mass.

"You said, 'Never report to work in a dirty uniform.' Well, mine's dirty."

SHRIMP GO THROUGH this flash-freezing tunnel racked on rail-traveling carts. Structure is of concrete and steel, and there is foot-thick foam glass insulation.

Super-Cold Freezes Food *Super*-Fast

Now an operating reality, SeaPak's 50-below-zero tunnel locks in shrimp flavor in a mere 13-min. run.

MINUS 50F. is the extremely low temperature at which the new tunnel in the SeaPak Corp., St. Simon Island, Ga., plant flash-freezes breaded shrimp.

Its 3,000 lb. per hr. capacity has increased the plant's potential output to 4,500 lb. per hr.

This extreme cold "seals-in" the flavor of the shrimp. Moreover, drip loss is slashed from 5% to 0.2%.

In addition, the shrimp are completely frozen in only 13 min.—instead of 2 hr. normally required.

The new tunnel is of concrete and steel construction, insulated with 12 in. of foam glass. It is 76x18.6x10 ft. and consists of a freezing area and two anterooms.

To obtain the desired low temperature in the tunnel, a 2-stage refrigeration system is employed. It comprises a 15x10 in. ammonia compressor (Frick) which is used as a booster, and a 9x9 upright unit for the 2nd stage. Capacity of the two compressors is 52 tons.

To circulate the cold air, through refrigerated coils and the tunnel, three Frick blowers are used. Adjustable louvres control both the velocity and direction of air flow.

After the raw shrimp have been washed, graded, peeled and deveined, they are individually pinned by the tail onto special steel racks. Then they are immersed in batter up to the tail joint, and coated with a special blend of breading.

Filled racks are loaded on special freezing carts (photo above) which are lined up in the first anteroom (held at about 0F.). Carts are then pushed through the tunnel doors, which operate automatically to cut down refrigeration loss and ice formation in the tunnel. Here a hydraulic pusher takes over and advances the carts through the tunnel. When filled tunnel holds 10 carts.

After approximately 13 min. carts are pushed through exit door of tunnel and into 2nd anteroom. Here, the solidly frozen shrimp are depinned from the racks, and are ready for packing. —*End*

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®Nash® Clean Air Compressors are simple, with only one moving element. No valves, gears, pistons, sliding vanes, or other enemies of long life and constant performance complicate a Nash. No aftercoolers are needed. You will find it profitable to investigate these pumps, now.

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No dust filters.
No internal lubrication to contaminate air handled.
No internal wearing parts.
No valves, pistons, or vanes.
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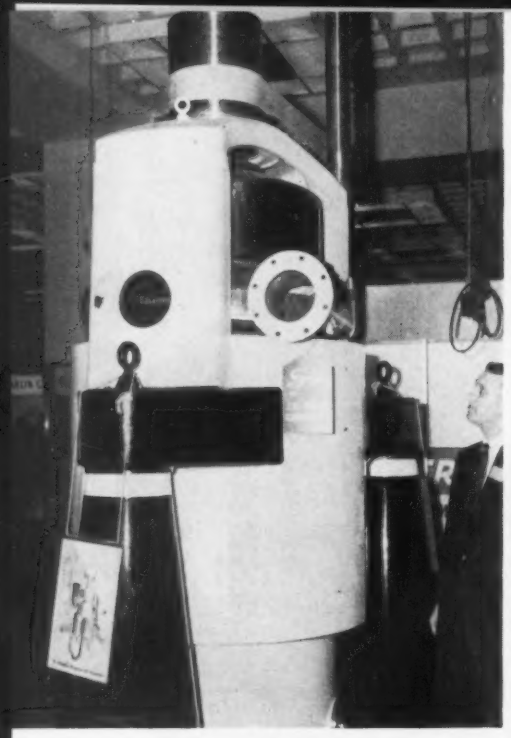


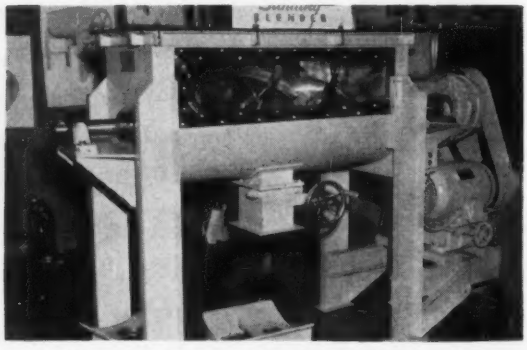
New Food Machines

Advanced mixing, separating, cleaning, control, and

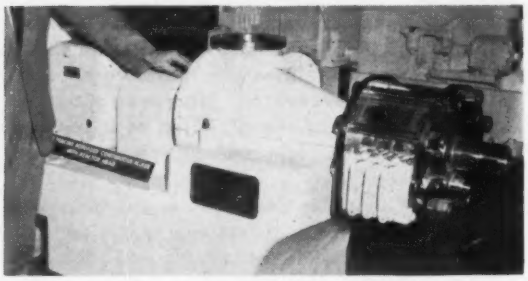
6 PROCESSING UNITS

DECANTER TYPE CENTRIFUGE of large capacity handles 200-250 gpm. at pressures to 150 psi. Vertical design enables high speed (2,000 rpm.) rotation, reduces sealing problems.—The Sharples Co., Philadelphia. (116A)

DISPERSION MILL for pastes, baby foods, meat products, mayonnaise, etc., consists of high speed rotor within conical ring-shaped stator. Faces of each unit are grooved, and grooves become finer from stage to stage of 2-5 grinding steps (depending on model). Milling gap decreases in downward direction for maximum size reduction.—The Pfaudler Co., Rochester, N. Y. (116B)



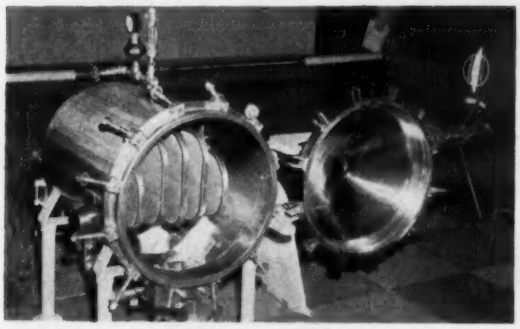
SANITARY BLENDER having special plug-type discharge, features all-welded smooth interior and quickly dismounted ribbon assembly that speeds and simplifies cleaning. Capacities: 10-400 cu. ft.—First Machinery Corp., Falcon Mfg. Div., Brooklyn. (116C)



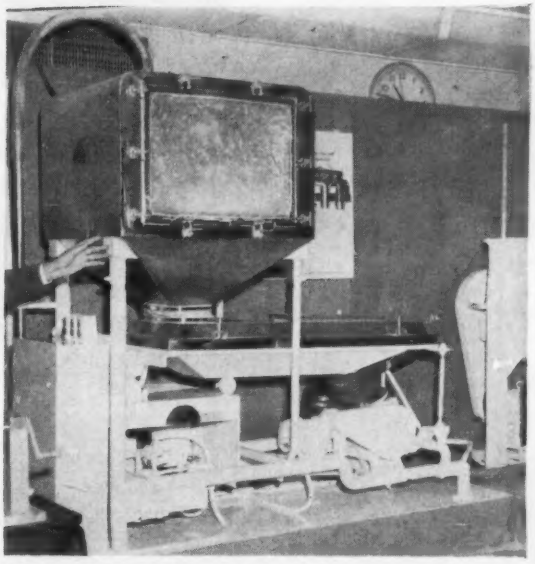
CONTINUOUS solid-liquid mixer for doughs, pastes, slurries employs tapered screw in conical housing. Interchangeable screws enable variations in mixing intensities. Screw assembly external to product flow, enables screw to be adjusted horizontally for wear, and to vary mixing action. Capacities: 1,700-7,000 lb. per hr.—Baker Perkins, Saginaw, Mich. (116D)

at Chem Show

measuring units displayed in New York



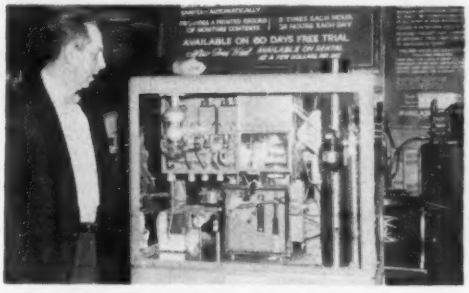
SELF CLEANING FILTER has trough bottom and screw conveyor for discharge of heavy solids without opening unit. Features vertical rectangular plates that insure even precoat. Plates are cleaned with individually controlled pressure sprays and/or air pressure vibrator.—Sparkler Mfg. Co., Mundelein, Ill. (117A)



COMBINATION dump bin, sifter, air conveyor for bagged materials employs gyratory action for screening efficiency, low-pressure air system for transfer to mixers without dusting. Conveys materials up to 200 ft. at 100 lb./min., elevates 32 ft.—The J. H. Day Co., Cincinnati. (117B)

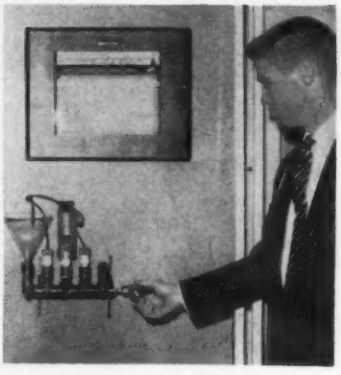
4 QC INSTRUMENTS

MOISTURE TESTER for powdery or granular materials automatically takes sample from main product stream each 12 min., records moisture content. Recorder may be installed remote from process.—Brabender Corp., Rochelle Park, N. J. (117C)



IN-LINE COLORIMETER continuously measures and records color intensity of flowing liquids or gases. Compensates for variables.—Beckman Instruments, Inc., Fullerton, Calif. (117D)

INFRARED UNIT gages moisture in 0.1-99% range with accuracy to 0.1%. Determinations take 3-18 min. depending on product.—Analytical Measurements, Inc., Chatham, N. J. (117E)



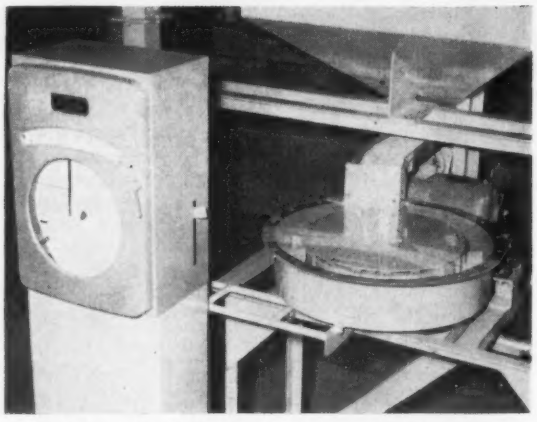
CHLORIDE ION ANALYZER continuously checks salt content of foods and solutions. Reads directly in 10-1,000 ppm. range.—Beckman Instruments, Inc., Fullerton, Calif. (117F)

CONTINUED →

6 CLEANING, MEASURING UNITS

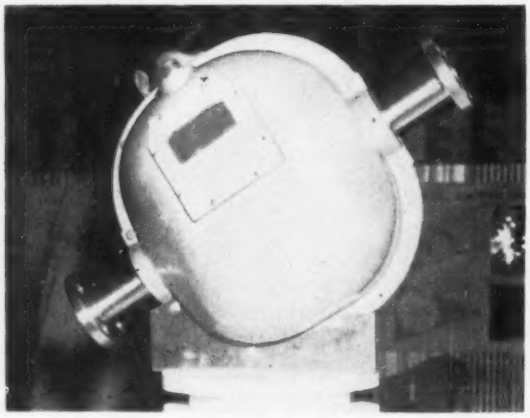
ULTRASONIC CLEANER provides mechanical action required for efficient washing of small parts such as pipe fittings and valves.—Bendix Aviation Corp., Davenport, Iowa. (118A)

HIGH-VACUUM MACHINE connects to plant's air line for dry- or wet-waste disposal, and for handling dry materials. Portable unit (foreground) has 30-gal. tank on integral base, jet venturi, reusable bag, and dust filter.—Vac-U-Max, Belleville, N. J. (118B)



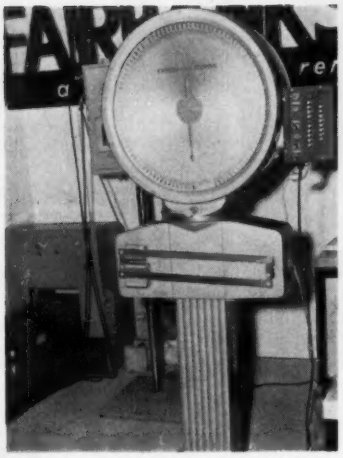
CONTINUOUS WEIGHER for dry materials combines simplicity with high accuracy. Can be employed to indicate or record flow rates in lb. per min., lb. per hr., tons per hr. Unit can be completely enclosed.—Stephens-Adamson Mfg. Co., Aurora, Ill. (118C)

AUTOMATIC CHECKWEIGHER, accurate to 0.1%, handles cartons and bags ranging from 20-100 lb. at 30 per min. Provides electrical under- and over-weight signals, and can be equipped with automatic rejector.—Exact Weight Scale Co., Columbus, Ohio. (118D)



MAGNETIC FLOWMETER of sanitary construction is designed to accurately measure any type liquid. With companion units it provides remote indication, recording, controlling or integration of flow rate. System is independent of power line variations over wide range. Sizes ½-8 in.—Fischer & Porter Co., Hatboro, Pa. (118E)

For further data on units circle key number on Reader Service Card in back of book.



DIGITIZER SCALE provides accurate weight recordings, transmits data for processing by automatic business machines.—Fairbanks, Morse & Co., Chicago. (119A)

Other Food Units

HIGH CAPACITY (300 gpm.) nozzle-type centrifuge employs double-row nozzle system with 30-in. bowl. Available in pressure- or vapor-tight, and open designs.—The Sharples Corp., Philadelphia. (119B)

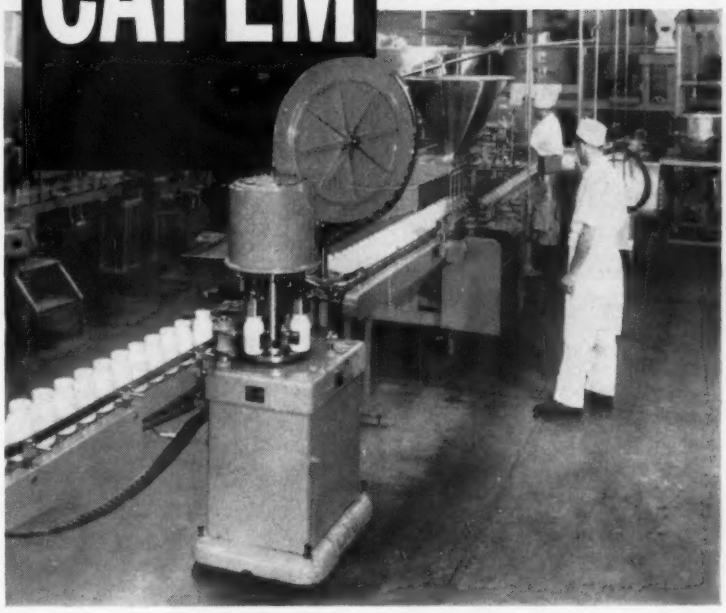
NEW CASES for temperature and pressure instruments of molded fiber glass are corrosion, impact, and moisture resistant.—Fischer & Porter Co., Hatboro, Pa. (119C)

2-STAGE COLLOID MILL features horizontal rotor and disassembly without tools. First stage employs specially designed impellers that shred product. Then it is forced between rotor and stator. Space here is adjustable during operation.—Manton-Gaulin Mfg. Co., Everett, Mass. (119D)

RAPID WEIGH BAGGER for pelletized, granular or meal-type products fills up to 24 open mouth paper or textile bags (100 lb.) per min. with accuracy within 2 oz.—Bemis Packaging Service, Minneapolis. (119E)

MIXING VALVE instantly makes hot water from constant supply of steam and cold water. Unit has 50 ft. of high-pressure hose, automatic spray nozzle, and dial thermometer for wash water. Recommended pressures: Water 50-80 psi.; steam 80-150 psi.—Strahman Valves, Inc., New York City. (119F)

CUT CAPPING COSTS WITH CAPEM



PFEIFFER FOOD PRODUCTS, INC. recently installed this new mayonnaise and salad dressing line in their Buffalo, N. Y. plant. They chose a CaPeM, Model C-4-F for the capping operation.

This capper applies 7200 caps per hour and handles jar sizes from 6 oz. to quarts. It incorporates a special Consolidated chuck-arresting device which prevents the chuck from dropping over the jar if no cap is present. No mayonnaise ever gets on the chuck.

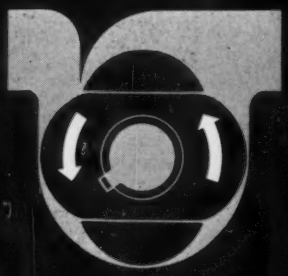
There are more CaPeM Screw Cappers in use than any other make. Users select them because they combine low initial cost, low operating cost, and a minimum of maintenance.

CaPeM applies any standard cap or cover and many special types at speeds ranging from 2,000 to 10,000 per hour. It handles bottles, jars, cans or jugs of any size or shape. It delivers a perfect LEAKPROOF seal.

For recommendations on improving your own capping operation, write Sales Manager, Consolidated Packaging Machinery Corp., 1400 West Avenue, Buffalo 13, N.Y.

CAPEM → **THE MODERN SCREW CAPPER**

NEW TWIN-LOBE® Positive Displacement PUMP*



Manton-Gaulin presents a completely new concept in rotary positive displacement pumping — The Gaulin Twin-Lobe*® design.

The two big features are simplicity and performance — results of a radically new "Twin-Lobe" pumping principle. Look at these advantages:

- Simple construction, only three moving parts.
- High mechanical efficiency, lower horsepower required.
- High vacuum, self-priming. Efficient enough to move volatile gases or extremely viscous liquids.
- Wide range of uses — handles corrosive and abrasive materials.
- Special alloys used throughout for long wear, precision fit.

Send for New G. T. A./TLP-57 Bulletin!

Complete description, data sheets and application guide are now available. Find out how the new Twin-Lobe pump can save money, improve quality.

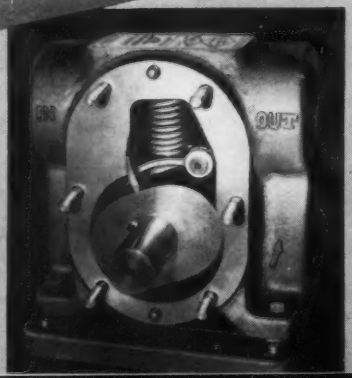
One Basic Design good for many uses

Liquids, heavy slurries, pastes, soft food solids, emulsions, gases, and light non-lubricating liquids

*Pat. Pending

Capacity and size range

Three models now available. Capacities: 0-56 gpm; Pressures: 0-200 psi.



Gaulin TRADE MARK

MANTON Gaulin

73 GARDEN ST. EVERETT 49, MASS.

World's largest manufacturers of stainless steel reciprocating, rotary, pressure exchange pumps, dispersers, homogenizers and colloid mills.

Ask GTA . . .

Gaulin Technical Assistance — for data on the complete Gaulin line: Homogenizers, Colloid Mills, Twin-Lobe Pumps, Triplex High Pressure Pumps and HX Pumps. Get GTA from your nearest Manton-Gaulin Representative . . .

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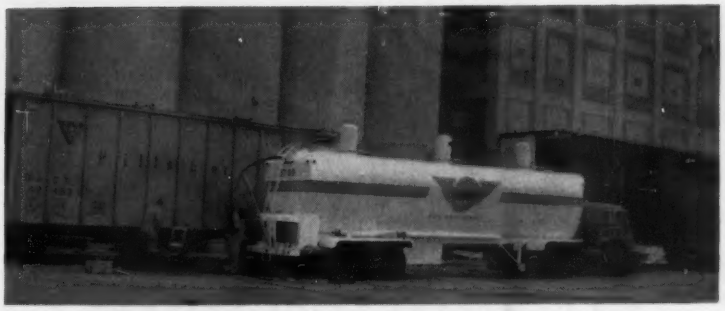


LOADING bulk flour from RR car at mill is Smith trailer hired to move bulk flour to bakeries.

Hired Deliveries Expand Bulk Benefits

Common motor carriers and leased trailers permit smaller millers and bakers to profit through bulk deliveries

ADVANTAGES of bulk flour handling are now within the reach of smaller Southwestern and Midwest millers and bakers who've been shunning purchase of their own bulk-handling equipment as uneconomical. Common carriers and leasing are the answers.

In the first-named area, the service is benefitting these mills: Russell-Miller (out of Dallas), International Milling Co. (out of Greenville, Tex.), Pillsbury Mills (out of Enid, Okla.), Okeene Milling Co. (out of Okeene, Okla.), and Colorado Mill & Elevator Co. (out of El Reno, Okla.). Further, eight bakeries have been supplied.

Providing the deliveries is Smith Transit, Inc., of Dallas, a specialized common carrier. It's handling bulk flour at published tariff rates.

Since 1956, this Dallas transport company has offered delivery service for companies in Texas, Oklahoma, Kansas, and Missouri. In addition, Smith has interstate operating authorities between points in Oklahoma, Texas, New Mexico, Louisiana, and Arkansas, and has received a recommended order from ICC to operate in 32 other states.

Three tractor-trailer units (both gas and diesel) and 225 pieces of special equipment are used to handle the flour. Only bakeries have been serviced to date—but the equipment is adaptable to other food materials.

Frequency of delivery ranges from four loads weekly to daily service. The 36-ft. trailers carry a payload of 43,000 lb., or 430 bags.

The mills and bakeries must provide suitable storage facilities and a 3-in. line for loading or unloading. Electric current should be available at the trailer parking site.

At the mills, loading is by gravity through three special airtight manholes atop trailers. A blower under the trailer aids in loading the trailers from railroad cars.

Bulk deliveries are made on the pound basis, with total weight determined by certified weighing before and after loading/unloading. No partial loads are carried.

Such use of common carriers is in line with a continuing trend toward the greater efficiency and economy of bulk ingredient handling (FE Mar. 1955, p. 112).

In the Midwest, Eckhart Milling Co., Chicago, had also demonstrated the advantages of bulk flour handling for the smaller company.

Eckhart leases trailer units. Here, a Miehle-Dexter two-stage blower and rotary air valve are the key to its unloading operation. The valve feeds flour from the trailer into an airstream line.

Air lines are arranged so that the portable hose connecting the truck's blower system with the customer's pneumatic lines may be connected from either side of the truck. A screw conveyor is located at the bottom of the tapered trailer body.

In loading the trucks, a blower system is also employed.

Efficiency of the loading/unloading operations enables a truck to make a roundtrip delivery in an average of 3 hr.

For more data, circle this page number on card at back →

FOOD PACKAGING: AN EXECUTIVE DECISION!

Visual promotion and "Help Yourself" buying make the package one of the critical elements in modern food marketing

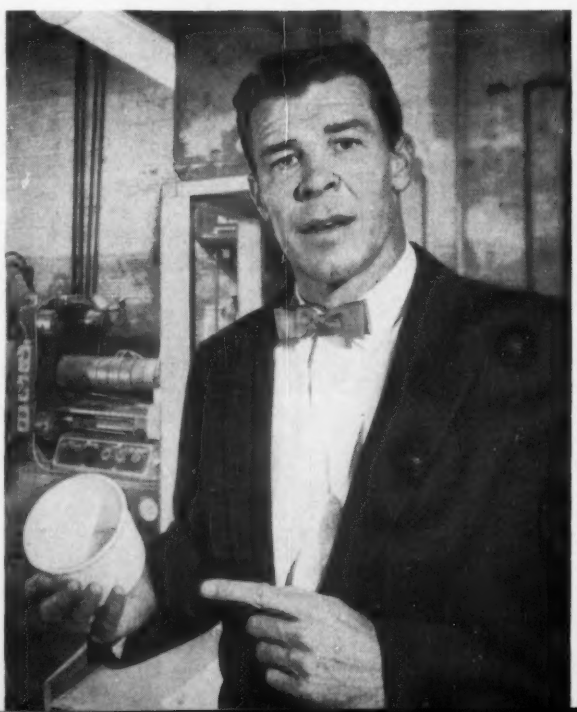
No question about the importance of the package in today's help-yourself markets. But which package will do the most powerful selling job?

Many marketers have taken that question to a package molder—with gratifying results . . . and profit.

Molded plastics packages offer the food marketer many positive advantages, readily translatable into sales boosts and cost cuts. There's sparkling transparency. Or a choice of lustrous clear-through colors. Strength without weight—to assure maximum protection, yet keep shipping costs down. There's easy storability. Stackability for mass displays. Dimensional stability even at refrigerated temperatures. And good adaptability to high speed automatic filling and capping procedures.

The package molder can perform many services for the marketer. His analysis of sales and cost requirements are based on long experience in visual food merchandising. He offers design assistance. His productive facilities can supply molded packages in the necessary volume, thousands or millions, with the most effective design, and at the right price.

Draw on the help your package molder can give you in "help-yourself." It is paying off for more and more marketers every day.



Monsanto

Monsanto supplies a large variety of Lustrex styrene molding compounds to America's leading molders of plastics packaging*

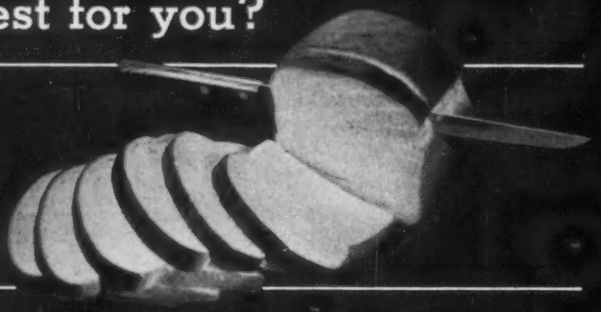
*LUSTREX: REG. U.S. PAT. OFFICE

Plastic containers and lids for many food products, including ice cream, sherbet, cottage cheese, salads, seafoods, sweetmeats, vegetable and fruit juices, are molded by *Plasti-Vue Mfg. Co., Inc.* (Fort Worth, Texas). A few of these packages are here displayed by V. J. Earnheart, President.

Specially designed, high-speed, brand-name imprinting machine prints manufacturer's name and message on container lids. *Plasti-Vue* offers both single and multicolor imprints for fast product identification.

The injection molding machine behind C. B. DeWees, Gen. Mgr., is fully automated, requiring only raw material supply and periodic adjustment. In 2 years, *Plastic-Vue* sales volume has increased 20 to 30 times, indicative of the increasing recognition of molded plastic containers as an important tool in food merchandising, on the production line, on store shelves, and in mass displays.

Which milk product is best for you?



Sweet Dairy Whey

A superior dairy ingredient that improves quality and reduces cost

Lactose

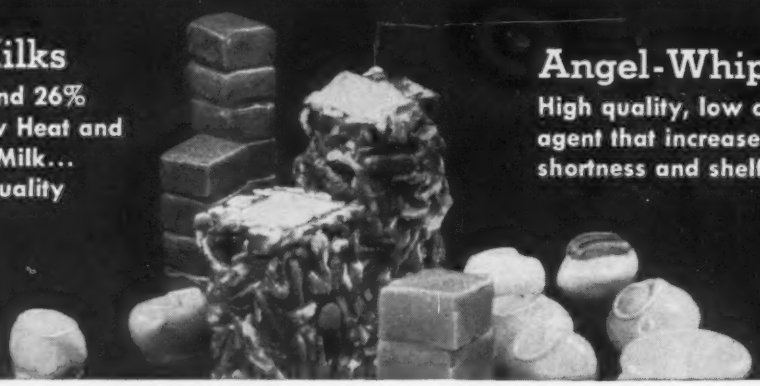
The low-sweetening milk sugar that works wonders in food formulas

Teknikan

The most economical source of that well-known special dairy solids flavor

Powdered Milks

Whole milk (28% and 26% fat), High Heat, Low Heat and Instant Nonfat Dry Milk... all of extra grade quality



Angel-Whip

High quality, low cost whipping agent that increases tenderness, shortness and shelf life

ASK THE MAN FROM WESTERN

THE Man from Western knows the answers to your milk problems.

He is a trained technical specialist, qualified to recommend the milk fraction best suited to your operations. And he offers you the largest variety of high quality milk products available from any single source.

Every Western product...from pure Lactose to powdered whole milk...meets rigid quality control standards. Buy them individually or in prepared blends for particular applications. You can depend on each lot to deliver uniform results.

Let the Man from Western show you how these rich dairy ingredients can improve your products and profits. He'll be happy to furnish you working samples and detailed technical bulletins. Or write: Technical Service, Department 16B. (Be sure to state application.)

Valley Fresh

Western Condensing Company

Appleton, Wisconsin

WORLD-WIDE SUPPLIER OF HIGH-QUALITY MILK DERIVATIVES

Hollowness in Pickles

Gas that accumulates in bloaters is formed inside the cucumbers and does not have its origin in the brine. It can be avoided entirely if gas escape routes are provided.

The formation starts in the vicinity of the central axis of the fruit soon after brining. It can be followed by plotting weight and specific gravity of fermenting cucumbers. Their increase may help detect potential bloaters as early as 3 days after brining. This early start is emphasized particularly if fruit is large size, or if fermentation progresses at comparatively high temperatures.

Anaerobic respiration of the tissues does not adequately explain the rapid formation of gas pockets. Microflora in the brine are known to produce gas of composition similar to that found in bloaters. But a time interval would be necessary for entrance of microorganisms from the surrounding liquid to center of the fruit, and one would expect this process to be slower in the larger fruit.

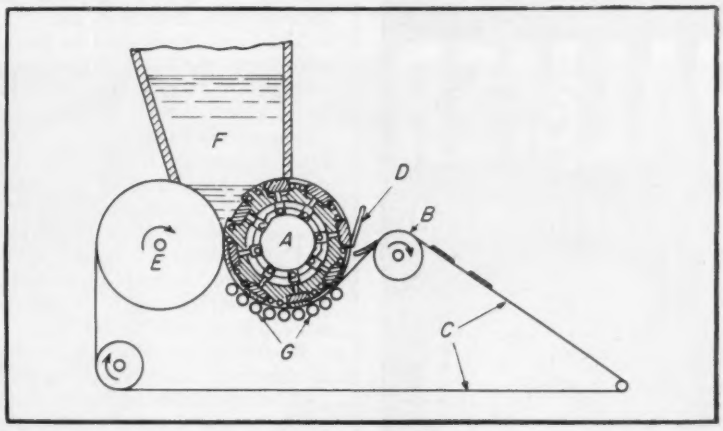
It thus becomes probable that the bacteria are present in the tissues of the cucumbers. This is supported by bacteriological evidence.—*Food Manufacture*, 501-6, Nov. 1957.

Pins Down Spectrum Change In Canned Plum Syrup

The ultraviolet spectrum of syrup in canned plums changes progressively during storage at 68-98.6F., reaching a peak in the region of 285 mmμ.

The responsible compound was found to be hydroxymethylfurfural, which results from the reaction of malic and citric acids with sucrose, fructose, or galacturonic acids found in canned fruits. It was separated by ether extraction followed by paper chromatography, and is formed at the same rate in both lacquered cans and glass jars.

Ultraviolet spectra of syrups indicated comparatively small losses of chlorogenic acid during storage for over 600 days.—*J. of Science of Food & Agr.*, 8(11), 639-45, 1957.



Produces Cheese Slices Continuously

A device for the automatic production of cheese slices of uniform size and thickness is the object of a recent patent.

Apparatus comprises a chill roll (A in drawing) mounted for rotation about its longitudinal axis, and having internal passageways for circulation of coolant. Also included are roller (B) immediately adjacent to the chill roll, an endless belt (C) passing around top of (B) and under (A), a scraper blade (D) contacting surface of chill roll, roller (E) positioned to press belt against side of (A), and a feed receptacle (F).

Chill roll has a plurality of molded cavities spaced about its periphery with an ejector in each cavity. Ejector has an outer face of the same curvature as that of the roll. It is movable between a first position—face even with roll surface—and a 2nd position—face recessed a distance corresponding to desired thickness of cheese slice.

Ejectors remain in first position until chill roll moves under receptacle (F) which is filled with fluid cheese. Then they move to 2nd position allowing cavaties to become filled with cheese. Ejectors remain in this position until belt (C) moves away from chill roll and passes over roller (B). Then they return to first position forcing cheese slices out of cavities so that scraper (D) can remove them. Slices fall on belt (C) and are conveyed to packaging.

Hardening of the liquid cheese in the cavities is produced by the coolant in the chill roll and cooling means within the plurality of rollers (G) that press belt against underside of chill roll.—U.S. Patent 2,815,573, Dec. 10, 1957.

Frozen Crab Cake Caution

Present wrapper directions for home heating of precooked frozen crab cakes do not provide for adequate heating from a public health standpoint. This is the conclusion of U. of Md. researchers following heat penetration studies of several varieties of frozen crab cakes.

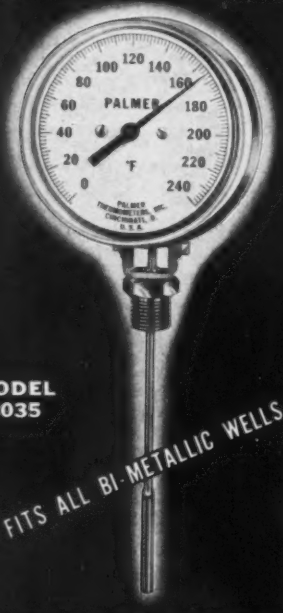
Temperature readings were obtained by inserting 24-gage copper-constantin thermocouple wires in the approximate centers of the cakes. Two methods of heating were employed—cold oven, in which cakes were placed at time oven was lighted, and oven preheated to specified temperature beforehand.

Unless dwell time was extended to compensate for period of preheating, cakes did not reach a center temperature sufficient to kill pathogens. And even when this time was extended or a preheated oven was used, suggested holding times were barely adequate.—*J. of Milk & Food Tech.*, 307-11, Nov. 1957.

Outstanding Accuracy

PALMER

Dial Thermometer



Check these functional features

- Direct-drive Bourdon Coil with a filled system for longer lasting accuracy.
- Stem can be placed at any desired angle and case can be rotated to most readable position.
- External calibration for zero setting.
- Unaffected by stem alignment.
- Accurate to one scale division.
- No sticking at any temperature.
- Non-corrosive case.

PALMER

THERMOMETERS, INC.

Mfrs. of Industrial Laboratory, Recording and Dial Thermometers

2515 Norwood Ave., Cincinnati 12, O.

Advances in Technology

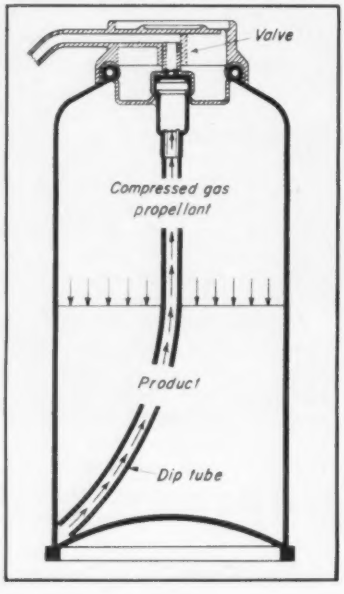
Milk Protein Concentrate

A new type protein concentrate with a body resembling yogurt is prepared by mixing separated milk with finely flocculated casein.

The casein is obtained by precipitation with lactic or citric acids, or biologically, using a cream or acidophilus starter culture. Method of its preparation influences flavor of the protein concentrate. When cream culture is used, product has a mild sour taste, when acidophilus culture is used the flavor is sharp and sour.

The product contains 21.8% solids, 13.8% protein, 5.6% lactose, 1.5% butterfat, and 0.9% ash. At 40F. it keeps well for 5-6 days.

Product is consumed as such or used in preparation of various foods, such as spreads flavored with chives, garlic, carraway, paprika, etc., or as crèmes and fillings with added fruit, compotes, jams or fruit juices.—*Vyziva lidu*, 12(2), 24, 1957. (In Czech)



Nitrogen Aerosols

An exciting new development about to be realized is the use of N_2 as a propellant in pressurized packages instead of hydrocarbons and their halogen derivatives.

Package consists of a can, product to be dispensed, dip tube, valve, and N_2 gas at 90 psig. (see drawing).

The new packages will not produce foams or sprays, but will conveniently deliver thin liquids, or thick pastes with viscosities up to 100,000 cp. in their original, unaerated form.

Upper limit of viscosity of product to be dispensed is set, not only by flow through dip tube and valve orifices, but by flow to cover bottom of tube when can has been placed on its side and then turned into an upright position.

Since no liquefied gas is present in the package, temperature-pressure gradient is quite flat (90 lb. at 70F., 105 lb. at 130F.). This is especially important for foods as it enables filled containers to be sterilized by autoclaving. At sterilizing temperatures pressure rise within the can is moderate.

Additional advantages of compressed N_2 as a propellant are prevention of oxidation, and hydrolysis of the product. Latter may make possible use of aluminum containers. —*Drug & Cosmetic Ind.*,

Stabilizing Beer Foam

Capacity of a fermented beverage to retain foam head may be greatly increased by addition of small amounts of hydrolyzed protein complexes obtained from spent grain or other sources.

Hydrolysates are prepared by heating wet spent grain to 180-200F. for 1-5 hr. in varying concentrations of acids and alkalis, then reducing pH to 4.3-4.8 and filtering out precipitate.

Hydrolysate is added to the beer between first and last filtration at 0.005-0.1% by weight of solids in the liquid.—US Patent 2,806,791, Sept. 17, 1957.

Keep Fans Running In Stationary Cars

Quality of perishable fruits and vegetables can be maintained at higher levels if fans in refrigerated or heated cars are operated while cars are standing in rail yards or sidings. At such times the fans may be operated by auxiliary motors.

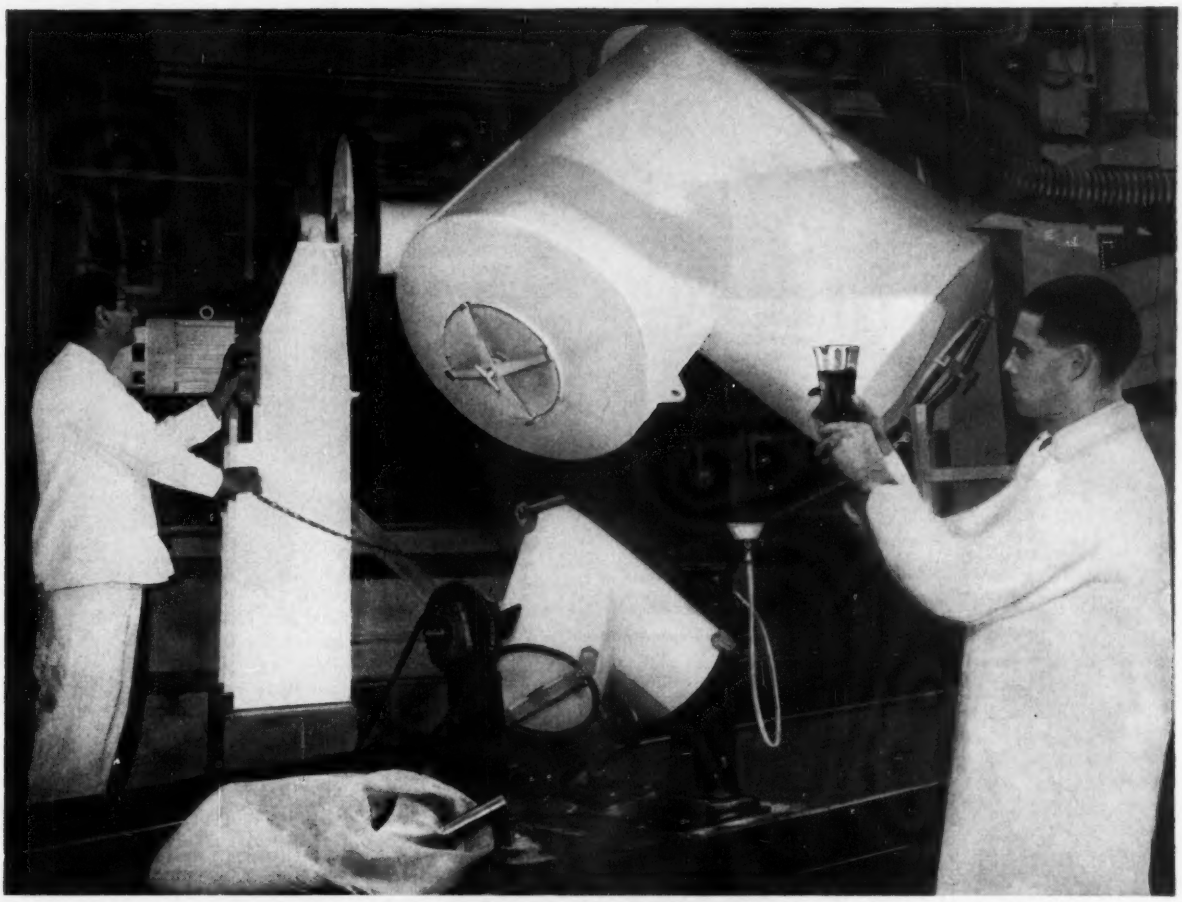
In 2 potato tests with refrigerated cars, top layer temperatures were 10-20 deg. higher in cars with fans not running, as compared with fan-operated ones.

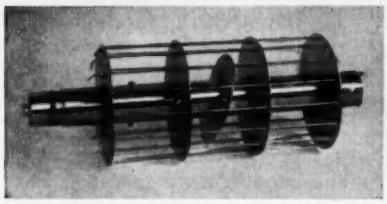
Operation of fans is also desirable during cold weather for maintaining higher bottom layer temperatures in loads of produce such as mature green tomatoes or sweet potatoes that are susceptible to chilling injury.

Results of tests with floor fan cars show that fans at only one end need

Now! For the first time

intimately blend any liquid, regardless of viscosity, into dry solids–in one fast step–even up to 40% liquid volume by weight





VERSATILE. This wire cage assembly gives you three blenders in one. With it you can blend liquids into solids, or obtain dry intensive mixing action. Remove it and get gentle blending.

TYPICAL EXAMPLE. Bar breaks down agglomerates in material at left and prevents new agglomeration as liquid is added. Note uniform consistency in finished blend at right.

ABSOLUTE UNIFORMITY. Laboratory smear test reveals streaks where standard blending methods are used (left). With P-K's exclusive design, complete blending is assured (right).

These results can be proved in your own lab with a P-K Laboratory Model Liquid-Solids* Blender. 8 or 16 qt. capacity available from stock for instant delivery.

Scale-ups from lab tests are equalled or bettered in P-K production models with capacities from 1 to 50 cubic feet. This is a completely new concept in liquid-solids blending —exclusive with P-K.

Write now for Bulletins 15A on lab units, 7-15-A on production units of P-K liquid-solids blenders. The Patterson-Kelley Co., Inc., 2002 Hanson Street, East Stroudsburg, Pa.

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*Patents pending

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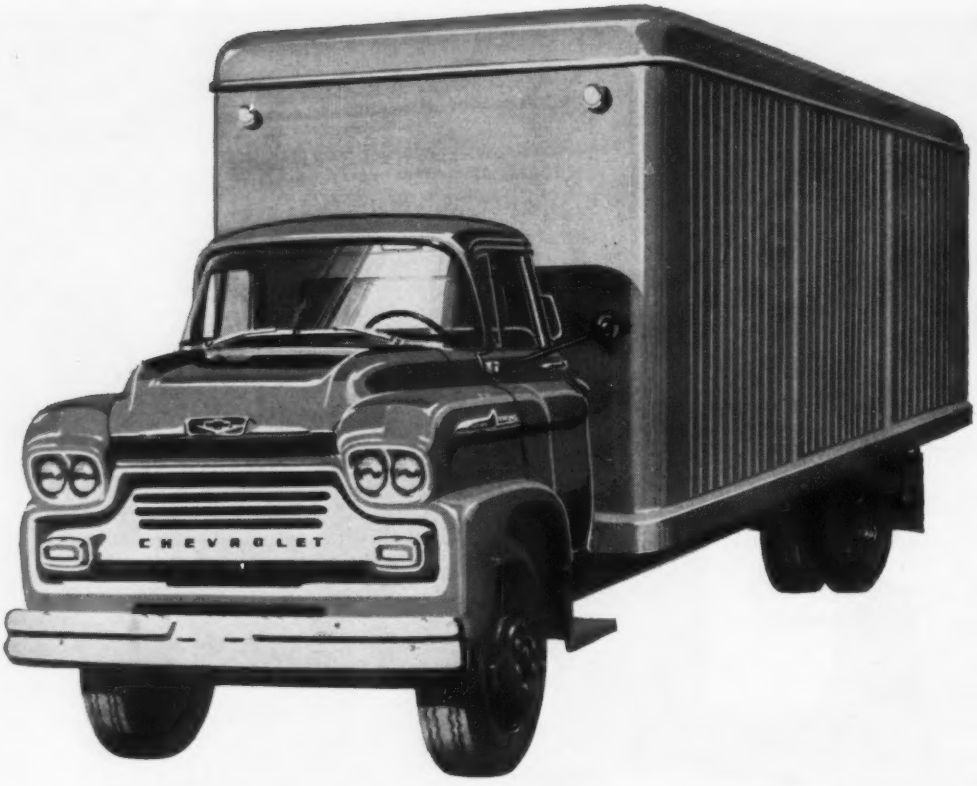
Never before has Chevy been so right for the food business!



Here's a truck specially designed to take to your kind of work like a duck takes to water! It's Chevrolet for '58 with new hustle, muscle and style that mean money in your pocket!

As you can see, Chevy's a honey of a truck this year, and that handsome, broad-shouldered '58 appearance only hints at the host of new and improved features that are ready to put you dollars ahead in the years to come. Whether you need a highway tractor or a straight truck for city pickup, *Chevrolet's ideally suited for your line of work.* In styling, for instance, Chevrolet for '58 has what it takes to build your business prestige every day in the week: new dual headlamps, new massive grille, newly contoured hood, new cab beauty, to mention just a few innovations.

And what workers these new Chevrolet middleweights are! There's extra power to do more work faster from new, more durable Taskmaster V8's . . . or from a new version of the famed Jobmaster 6, standard in Series 60. *High* G.V.W.'s—up to 14,000 lbs. in Series 40, and up to 21,000 lbs. in Series 50 and 60 models when equipped with heavy-duty options—assure big, profitable payloads. And you'll have the right chassis components for your job: husky parallel-design frame, hefty rear axle and the proper springs and transmissions to meet your needs precisely.

There are many such reasons why you'll want to see your Chevrolet dealer soon! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET

NEW CHEVROLET TASK·FORCE 58 TRUCKS

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be operated. This is not satisfactory with bananas, probably because they are loaded in such a manner as to allow air to by-pass product.

In partly unloaded cars, with some of the floor rack area uncovered, the same situation might prevail. So bare floor racks should be covered with paper or packages of produce to force the air through the products.

In cars with electric overhead fans, those at both ends of the car are operated, since one drive assembly operates all fans.—*Agr. Marketing* (USDA), 19, Nov. 1957.

Butter Packaging Machine

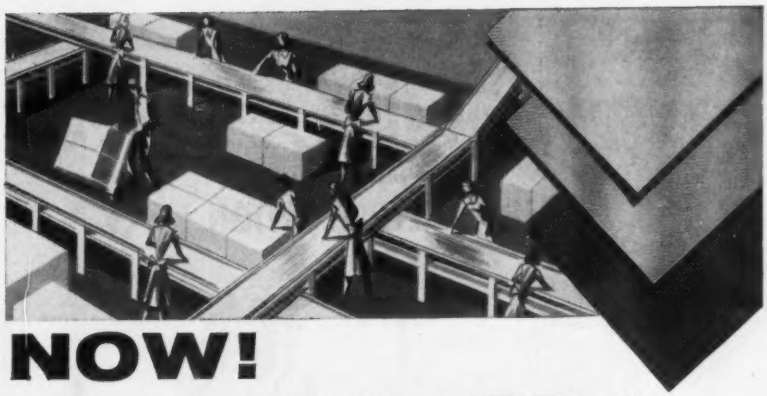
A machine for automatically packaging 56 lb. blocks of butter in cardboard cartons following extruding from an existing forming machine, was recently developed in New Zealand.

In operation, the block is extruded from a molding machine onto a conveyor where it is check-weighed and embossed with the company's trade mark. A control button is then pressed causing the block to be transferred by vacuum to a sheet of parchment or foil, wrapped, and dropped into a carton on a conveyor below. Carton is ejected pneumatically onto another conveyor where its flaps (coated with glue) are ploughed down and sealed by compression rollers. Sealing tape is then applied along the folded flaps, and the container discharged from the machine.

Safeguards are installed on the air- and vacuum-operated machine to insure trouble-free operation. These stop it automatically if: (1) the embossing pad does not lift and transfer block to wrapper; (2) wrapper is not in place; (3) carton is not in place, and (4) block is not completely in the carton. Machine cannot be restarted until cause of stoppage has been rectified.—*New Zealand Dairy Exporter*, 33 (1), 11, 1957.

Thermal Drying of Seaweed Is Possible With Drum Unit

Seaweed used for manufacture of alginates, feeds, and fertilizers, is often predried by exposure to air followed by drying in through-circulation dryers. But the large particle size of the weed greatly reduces thermal efficiency and such drying



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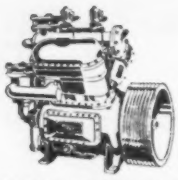
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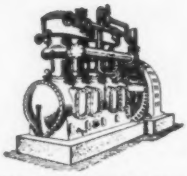
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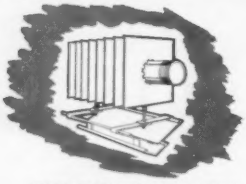
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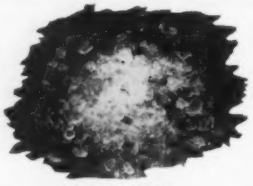
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Advances in Technology

requires about 4,000 Btu/lb. of water evaporated.

Drum drying of comminuted weed is possible, but requires a mill that will rid the pulp of the adventitious pieces of rock that cling to the weed during harvesting. The Scott-Rietz disintegrator, a vertical shaft, fixed hammer mill, which discharges tramp material separately, was found to yields pulp that can be dried successfully on a double drum dryer using steam at 80 psi. About 1.5 lb. of steam per lb. of water evaporated was used to reduce moisture content of weed from 60 to 85% to 12%.

There is some loss of alginic acid and grade strength that may make thermal drying unsuitable for high grade alginate production but leaves it satisfactory for most alginates. Operating cost under English conditions is estimated at $36-$42 a ton of dry weed.—*J. of Sc. of Food & Agr.*, 7 (11), 705-10, 1956.

Quality of Dough Improved With Glucose Oxidase

Improved dough formations may be achieved by the addition of a minor proportion of the enzyme glucose oxidase.

According to a recent patent, this enzyme expedites changes that are normally accomplished only by aging the flour for some months. Other materials such as ascorbic acid, nitrogen chloride, chlorine dioxide, bromates, and benzoyl peroxide may be added, the first being particularly effective.

In general, at least one part by weight of the enzyme is used per 500,000 parts of flour or baking composition. Blending should be thorough. Dough from the treated flour has increased strength and better handling qualities than dough from untreated flour, and the baked products have improved texture and appearance.—U.S. Patent 2,783,150. Feb 26. 1957.

Extending Beer's Shelf Life

Treatment with glucose oxidase enables pasteurized beer to maintain brewery freshness for many months, greatly extends keeping quality of the unpasteurized product without refrigeration.

Results of comparative tests on glucose oxidase-treated and untreated unpasteurized beer showed that flavor and appearance of the treated prod-

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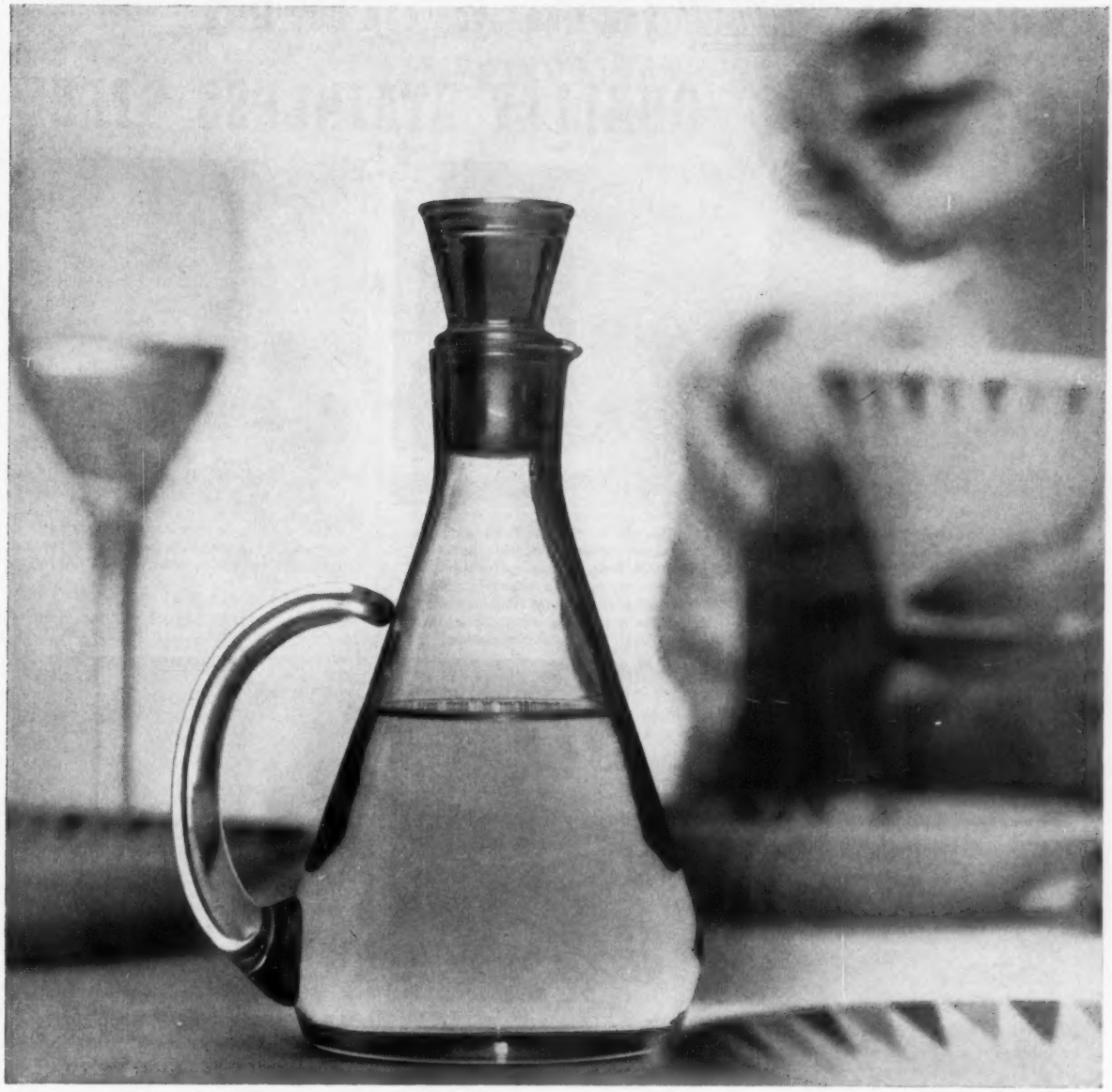

Oil, vinegar, spice flavors—
and clear as a choice Rhine wine

You would know better than we whether there is any future in this idea.

The cruet contains 10% of water. It might have been vinegar. The rest is oil. Half of the oil is the usual triglyceride salad oil. The other half of the oil is distilled monoglyceride. It is equally wholesome food. The monoglyceride dissolves both the conventional salad oil and the water. This clear, uniform, stable solution can carry both oil-soluble and water-soluble condiments and flavor extracts.

It would be interesting to experiment with other ratios of triglyceride to monoglyceride. This is for food processors to do, not for us. Our business is making Myverol® Distilled Monoglycerides so pure they can give this effect. We shall be delighted to supply food processing firms with free samples for their experiments. ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York, Chicago, and Memphis • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

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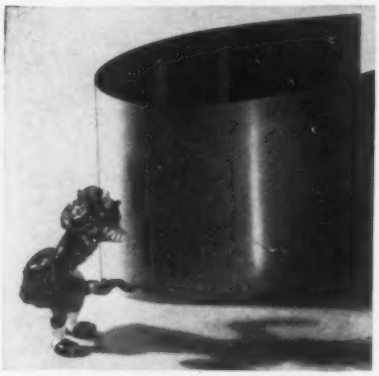


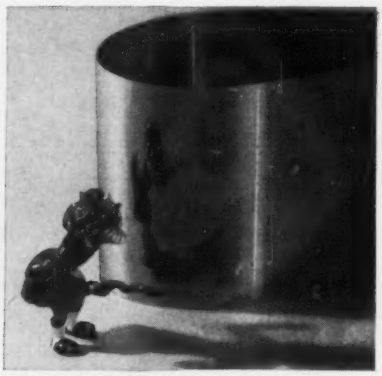
2D—A silvery white, but non-lustrous, surface produced by annealing and pickling cold reduced material. Steel sheets & strip in this condition are most ductile and the surface holds lubricant well for severe drawing operations.

2B—Steel in the 2D condition which is subsequently rolled on a "skin pass" or temper mill. The surface acquires a bright finish from the polished rolls. This surface is somewhat more dense and hard than 2D and is a better starting surface for later finishing and buffing operations.

No. 3—This surface is made by grinding with a No. 100 abrasive. This surface is smooth but not as reflective as 2B.

No. 4—A finer finish than No. 3 made by grinding with a No. 150 abrasive. Like No. 3, this surface is easily blended with hand grinders after forming, drawing or welding.

No. 7—Good reflectivity and brilliance made by polishing with a No. 400 abrasive. This semi-mirror finish must be protected during fabrication by adhesive paper or strippable plastics lest the finish be marred beyond repair.



BRIGHT—A highly reflective surface made by cold reducing with highly polished, glass-hard rolls. This finish is only available in Type 430 stainless.

These are our standard surface finishes that are available in types 201, 202, 301, 302, 304 and 430 except Bright which is type 430 exclusively.

These finishes are regularly supplied in sheet and coil form in widths up to 48 inches.

Since Nos. 3, 4, 7 and 430 Bright are smooth reflective surfaces, they are not recommended for severe drawing without special precautions as the mill finish may be marred. Applications such as dairy machinery, kitchen and restaurant equipment and architectural decorative work require only local forming, so these highly polished surfaces are not greatly disturbed. All mill polished sheets are carefully packed to avoid handling imperfections. Protective adhesive paper can be specified by the buyer when needed.

For specific information on recommended surface characteristics for a particular stainless steel sheet and strip application, address your request to our Product Development Dept.

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uct did not change in 50 days at room temperature. Yeast counts were about the same at the end of the test as at the beginning. Untreated beer showed a large increase in yeast count, and had a milky appearance after 50 days.

In the case of pasteurized beers, glucose oxidase binds a substantial portion of the oxygen before pasteurization, thus preventing the oxidation reactions (initiated during pasteurization) which result in shorter shelf life. In case of canned beer, removal of free oxygen reduces iron pickup from the can.—*Food Technology*, 503-7, Oct. 1957.

Detecting Rancidity in Butter

The possibility of applying spectral analysis to determine the rancidity of butter was recently investigated in Russia, using a quartz spectrophotometer.

Butter was first rendered at 177F. Then resulting butterfat was boiled with water and 25 ml. of distillate examined for transmittance at 280 mμ. Thickness of distillate layer was 10 mm. Value obtained was compared with that of distilled water which was considered 100%.

The method was tested on butterfat stored for 6 months at room temperature. Chemical and organoleptic tests were conducted simultaneously. Initial value for fresh butterfat was 84%. From the 4th month, transmittance decreased, reaching 32% at 5½ months when definite symptoms of rancidity were noticed.

On the basis of these results, the author set up the following scale: (1) Transmittance at 280 mμ of more than 80%, high quality fat having good keeping quality; (2) Transmittance of 40-79%, good quality fat, but unsuitable for prolonged storage, and (3) transmittance below 40%, rancid and unsuitable for human consumption.—*Mol. Prom.*, 18(6), 31, 1957. (In Russian)

Best Temper of Chocolate

Chocolate with the right temper for a satisfactory coating has a cocoa butter crystal structure differing from that of the untempered product, taken from the conche.

The different degrees of temper are related to the amount of seed crystals present and can be estimated from cooling curves of the molten

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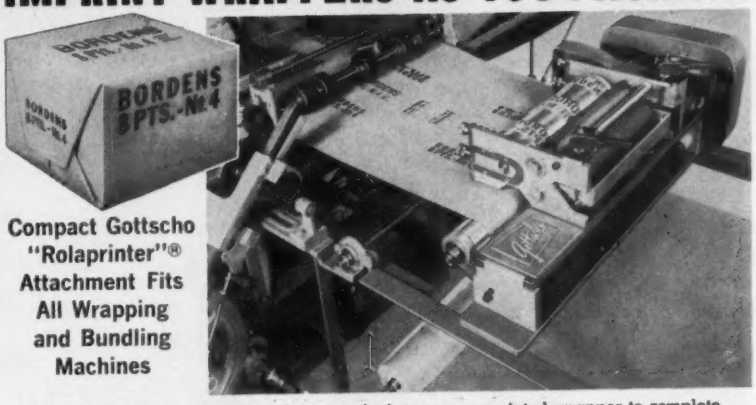

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Ideal for imprinting anything from a code-date on a preprinted wrapper to complete display copy on 5 sides of a bundle overwrap. Fully automatic . . . requires no attention during operation, synchronizes with parent machine at regular production speeds . . . provides accurately positioned imprint. A miniature flexographic printer, the ROLAPRINTER attachment uses fast-drying liquid inks of any color and stick-on rubber type or dies. Assures consistent quality on all *films, foils* and *papers*. Mechanically simple . . . copy changes and adjustments for different wrapper sizes can be made quickly by untrained personnel. Models available to imprint areas from 1" to 24" wide.

For complete information please submit details of your requirements, including make and model of wrapping machine.

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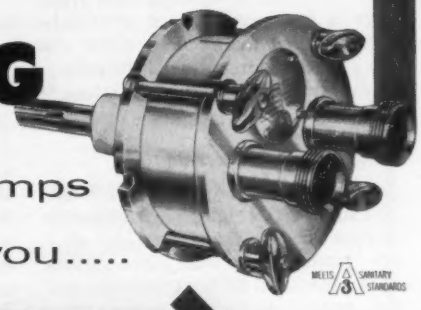

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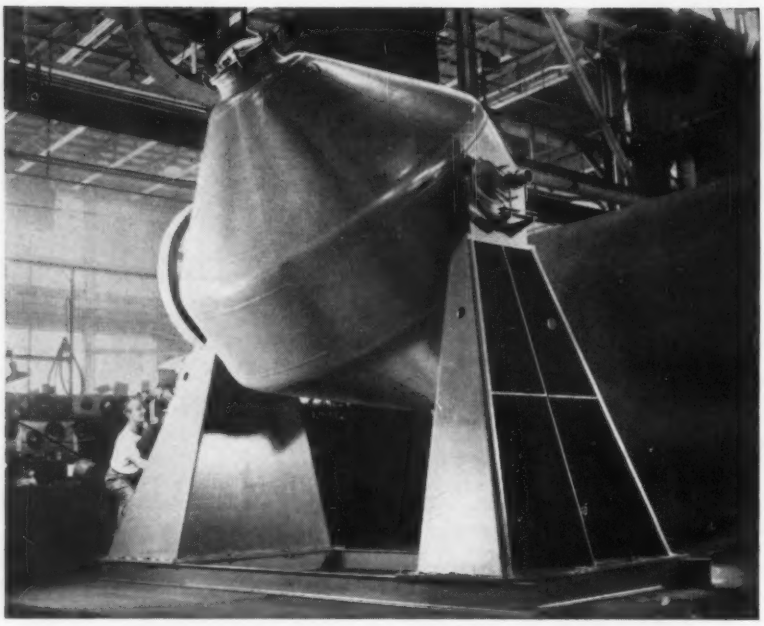

Do separate drying and blending of your product take days rather than hours?

Look then to Pfaudler and the conical dryer-blender with which you can dry and blend the same materials in a *single* operation—and cut processing time from days to *hours*. Also, you save substantially on labor costs, since the wet product is introduced directly—eliminating intermediate materials handling.

Unique tumbling action

The Pfaudler dryer-blender works on a similar principle as an automatic clothes dryer. Your wet materials are "tumbled" so that more surface area is exposed to heat and air, and the entire operation takes place under vacuum. Product comes out dry in only a fraction of time with conventional dryers.

This same action also mixes materials thoroughly to produce a homogenous product.

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You can handle the most corrosive materials safely and without affecting product purity because this dryer-blender with its glassed inner surface protects your product against metal contamination. The smooth surface of Pfaudler glass facilitates quick and thorough cleaning with *no* residual product adherence. For more information on the *conical dryer-blender* and other integrated process equipment from Pfaudler, check coupon.

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Please send bulletins on the ☐ Conical Dryer-blender and this other Food Processing Equipment by Pfaudler: ☐ Heat Exchanger ☐ Tanks—Mixing and Storage ☐ Titan Superjector ☐ Filler—Rotary Piston Type ☐ Evaporators—Film Type.

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Advances in Technology

chocolate. Curves of untempered chocolates show a rapid temperature drop to the point where crystals begin to form. Here the product becomes solid and the temperature rises.

With tempered chocolate, the temperature decreases more slowly since latent heat of crystallization tends to maintain the temperature.

If a ½ lb. portion of molten chocolate is cooled in an ice-water bath and its temperature recorded every 60 sec. till it solidifies, a time-temperature curve may be constructed whose slope or "tempering tangent" is an indication of the chocolate's temper. When points are plotted on a scale (0.5 in./deg. C. and 0.2 in./min.) and a straight line is drawn through the points between 26 and 29C., completely untempered chocolates give tangents between 2.6 and 2.8.

Lines for correctly tempered chocolates have slopes of 1.05-1.15. Over tempered chocolates containing too much seed give values below 0.9. Temper of chocolate in an enrober can be followed and modified by changing the temperatures and flow rates with this method.—*International Chocolate Review* 12(11), 462-73, 1957. (In English, French, and German.)

Low-Cost Raying of Meat

According to a recently patented process, packaged food such as ground meat may be sterilized and preserved by ionizing radiation at relatively low cost with low-voltage equipment.

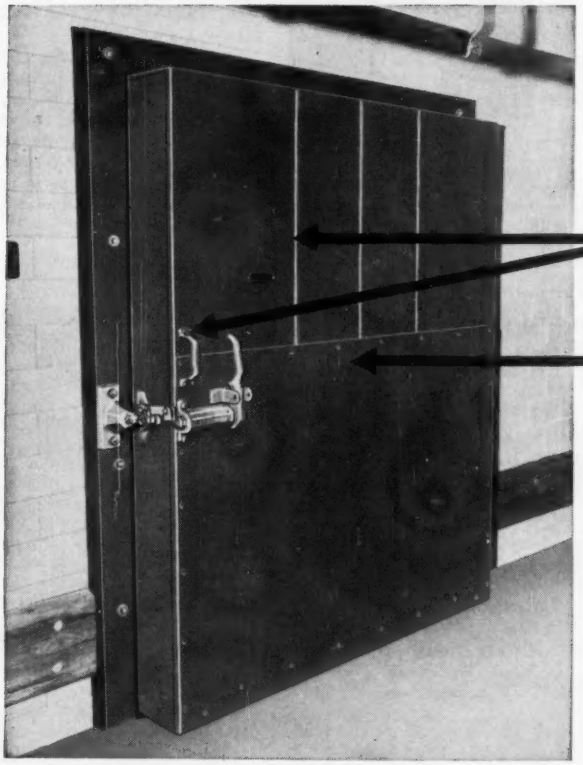
Ground meat is stuffed into a tube of laminated cellophane, which is deaerated, filled with nitrogen and sealed.

Tube is formed into a ribbon 6 in. wide by 12 mm. thick, and passed under beam of high-intensity electrons. Electrons should be accelerated to approximately 2.1 million volts, and exposure should not exceed several sec.

Ribbon is squeezed together at intervals, heat-sealed and cut into individual packages. These are enclosed in storage containers for distribution to retail markets.

If long storage is expected, entire container may be subjected to a dose of high-intensity electrons sufficient to penetrate the outer container but not sufficient appreciably to penetrate into the meat.—U.S. Patent 2,807,549, Sept. 24, 1957.

Extra protection features for Jamison super freezer doors



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vestibule save refrigeration

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it imparts to raw beans an outstanding stabilization to dehydrating treatment.

Lactarin 100 is a new hydrocolloid extracted from selected marine plants by a special Algin Corporation process which greatly enhances the useful properties of the natural plant colloid. It is super-refined; meets the highest standards for purity in the food processing industry.

The potential applications of Lactarin 100 extend over a much wider range than that indicated by the above examples. This potential holds unusual rewards for the kind of imaginative research in which we are cooperating with many firms in the food industry. Write, telling us what you feel free to divulge about your product, your method of processing, and your problem.

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MEN & COMPANIES

Prodigy Prexy . . . At only 37, and after but 4 yr. with Hawaiian Pineapple Co., Herbert C. Cornuelle has stepped up to the presidency—on one day notice. Initially p.r. director, he had advanced to v.-p. He succeeds Henry A. White, 61, now board chairman.

Question: Will this shuffle modify Hapco product-diversification moves? It now offers other fruit and vegetable items through its mainland cannery (San Jose) and subsidiaries F. M. Ball & Co. (Oakland) and Paulus Bros. Packing Co. (Salem, Ore.). It also handles citrus products through Ridge Citrus Concentrates, Inc., Davenport, Fla.

Record sales marked the last fiscal year. But diversification costs and lower profit margins depressed earnings.

Herbert C. Cornuelle

William Bien

All Out for Marketing . . . Facing facts in the brewing field calls for big stress on the "marketing concept," in the belief of Anheuser-Busch.

Thus, it has promoted its V.-P. William Bien, formerly general sales mgr., brewery div., to new post of v.-p. of marketing.

Mr. Bien particularly cites "static beer sales while per capita consumption declines" and "new growth of sales through food stores."

He suggests that the marketing concept leads to extra help for the stores—through "displays, promotions, and organizing of their beer departments—regardless of brands.

"And company operations must fit into a single plan to compete successfully."

Big Spender . . . "Buy profitably and with integrity." That's Alfred S. Wells' credo for a purchasing agent. And for him it has spelled out noteworthy success.

His appointment to v.-p. of purchasing climaxes over 30 yr. of spending for Corn Products Refining Co. In them, he has loosened purse strings for more than $4½ billion. During '58 he expects to direct purchases of about $150 million.

He succeeds retiring V.-P. Alwin H. Praeger, who will stay on in an advisory capacity.

Side glimpses on Mr. Wells: He began as office boy . . . In '48 his company sent him to Harvard for advanced management training.

Alfred S. Wells

Here's a **BASIC CONTAINER**

so good it gives new "sell" to your product!

NEW "SELF-TRACKING" TEAR STRIP ▶

Its many sales-making features offer proved consumer appeal!

Canco invented this well-known can for the vacuum-packing of coffee. Now it's also used to package candy, cookies, powdered milk, peanuts, medicinal tablets, cocktail snacks and other items.

Perhaps *your* product could benefit from this can's many special features. Consider them:

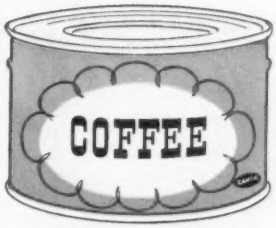
It is airtight; can be vacuum-packed, gas-packed, or used without special treatment. It packs and stacks readily, is a snap to price-mark, is strong and durable, has a reclosable lid.

Its new "self-tracking" tear strip winds smoothly, never "spirals," makes opening much easier. Serving or measuring is easy, too, because of the can's full opening.

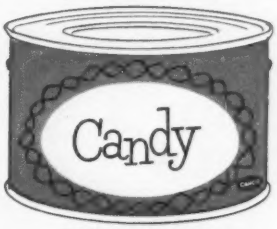
The broad shape of this container allows a big, eye-catching label. What's more, you'll be amazed at the variety and quality of lithography Canco offers —including sparkling metallic effects.

Your Canco representative will gladly show you samples and tell you more about this adaptable container.

HERMETIC SEAL



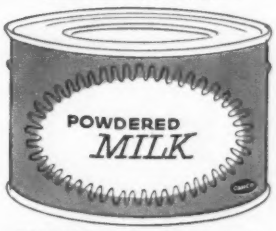
EASY TO OPEN



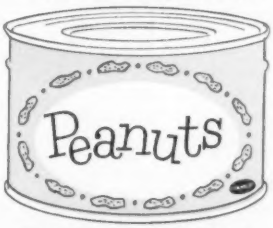
RECLOSABLE LID

FULL OPENING

BROAD LABEL AREA



BEAUTIFUL LITHOGRAPHY



PRODUCT PROTECTION

TUNE IN! "DOUGLAS EDWARDS WITH THE NEWS" *on CBS-TV, sponsored alternate Fridays by Canco. Check local paper for time and channel.*

CANCO AMERICAN CAN COMPANY

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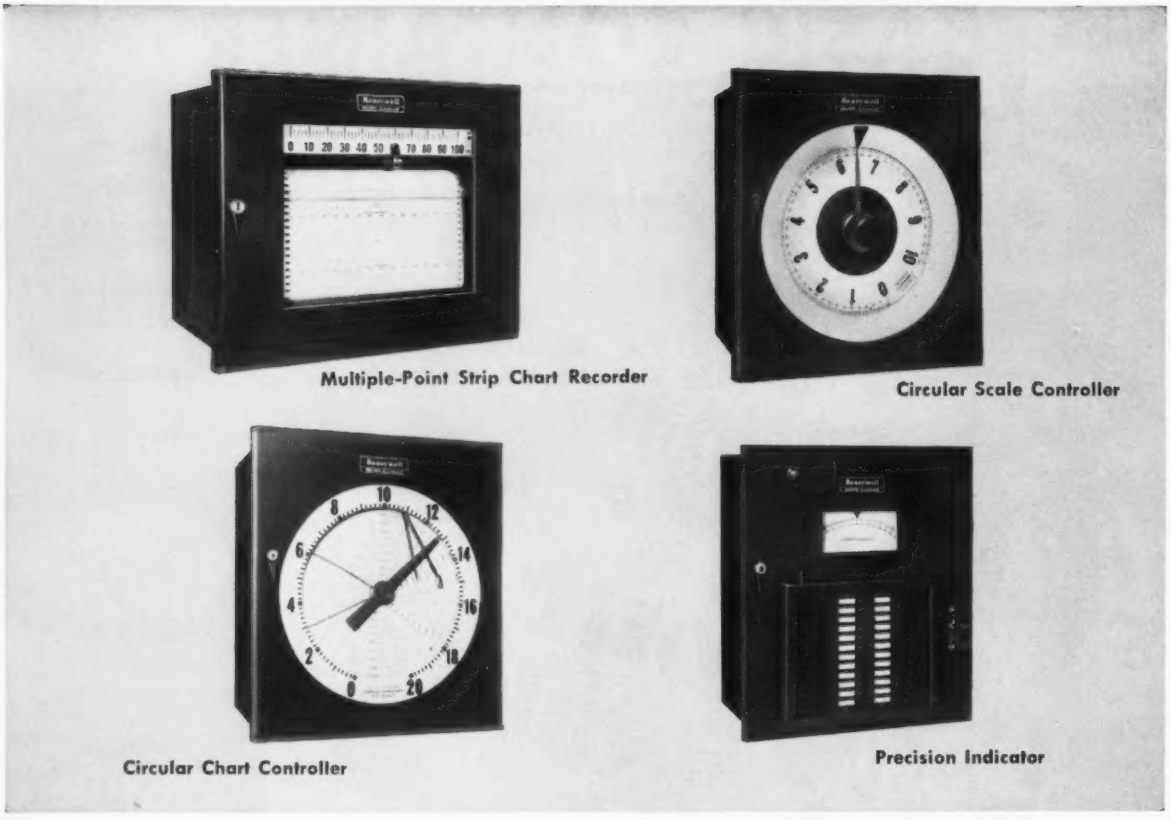


Improve your process with simple, easy-to-maintain *ElectroniK* instruments

USE *ElectroniK* INSTRUMENTS WHEREVER YOU NEED PRECISE, SENSITIVE MEASUREMENT

•

Unmatched variety of models for pH, redox, strain, temperature, pressure and other variables.

•

Easy maintenance — standard parts and assemblies are readily available and simply installed.

ElectroniK recorders and controllers are actually simpler to use and maintain than comparable mechanical instruments . . . they're far more accurate, more versatile, and have faster response, too.

You can mount *ElectroniK* instruments as far as 1500 feet from your process without loss in performance. That means you can concentrate all process data on centralized instrument panels . . . and thereby increase operating efficiency. There are no capillary lines to break . . . no need for instrument recalibration in case of a broken wire, which is easily spliced.

Use *ElectroniK* instruments in research, for inspection and accounting records, as well as in processing. They measure any variable that can be converted into a proportional electrical signal.

Get complete details from your nearby Honeywell field engineer. He's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Products Group*, Brown Instruments, Wayne and Windrim Avenues, Philadelphia 44, Pa.

Honeywell

H HONEYWELL First in Controls

Management Coach . . . You can't depend on luck to turn up key men when you need 'em. This is the conclusion of Interstate Bakeries Corp., K. C., Mo. So it will "grow its own."

Picked to direct its program is Charles A. Dailey, who was recently a specialist "executive-spotter" for George Fry & Assoc., mgt. consultants.

"But the real director of management growth is always the president," emphasizes Dailey. "If production and marketing are muscles of a company, fresh talent is the lifeblood — and its development is part of the art of management."

Coaching aspects: "Improved supervisor-subordinate worker relations, job rotation, special executive assignments, etc."

Charles A. Dailey

Dr. Gustave T. Reich

Sugar Honor . . . For pioneering research on molasses and by-products, Dr. Gustave T. Reich has been awarded a "Special Diploma" by the Sugar Technologists Assn. of Cuba.

Among his "firsts" have been processing of molasses for recovery of high grade distillers yeast, and converting manufacture of jelly and preserves to continuous process.

Formerly technical director of Pennsylvania Sugar Co., Philadelphia, Dr. Reich is now a consultant specializing in continuous processes.

How Much for Research? . . . A. E. Staley Mfg. Co., Decatur, Ill., is now among the 150-plus companies who pool their research experience as members of the Industrial Research Institute. Its representative will be Technical V.-P. Dr. Thomas L. Gresham.

Commenting upon the significance of U. S. industrial research, Dr. Gresham points to the annual expenditure of $5 to $6 billion. "Research by private industry represents a major contribution to the nation's effort," he states.

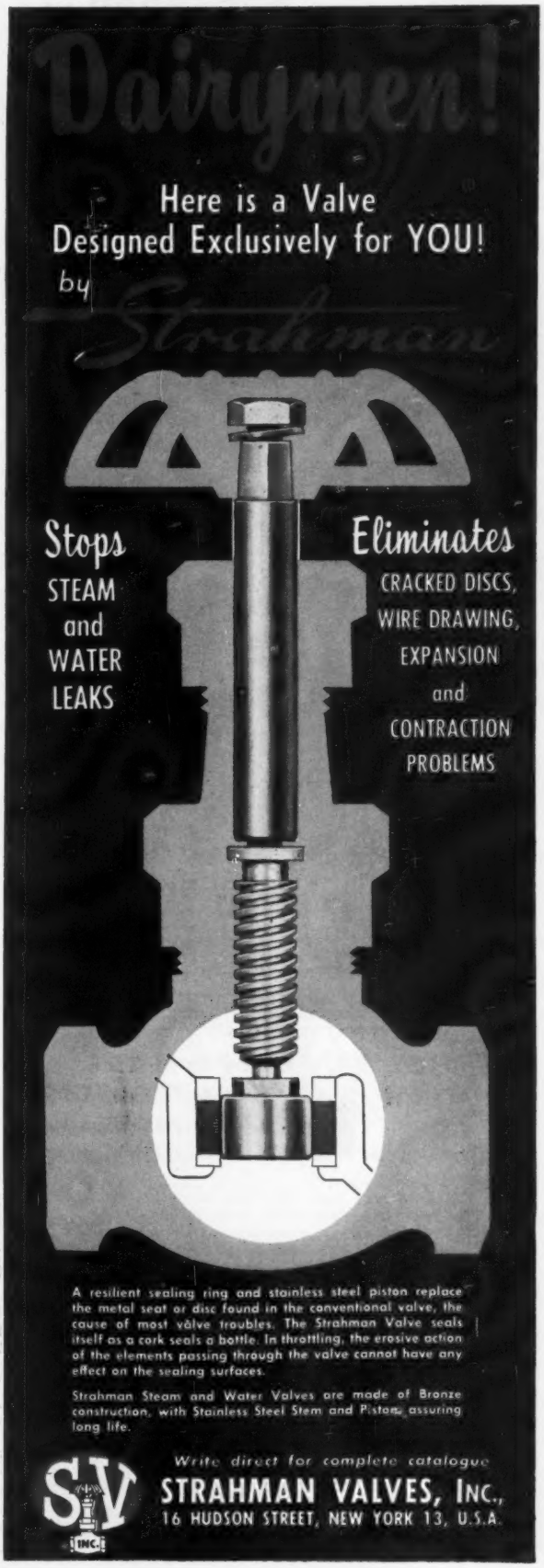
"Scientific achievement and technological knowledge belong to those who seek them most determinedly.

Dr. Thomas L. Gresham

"We at Staley are rapidly accelerating our research program."

Roger Bengston is new market research director of Green Giant Co., Le Sueur, Minn.

Dr. Vannevar Bush has been elected board chairman of Merck & Co., Inc.


Dairymen!
Here is a Valve
Designed Exclusively for YOU!
by Strahman
Stops
STEAM
and
WATER
LEAKS
Eliminates
CRACKED DISCS,
WIRE DRAWING,
EXPANSION
and
CONTRACTION
PROBLEMS
A resilient sealing ring and stainless steel piston replace the metal seat or disc found in the conventional valve, the cause of most valve troubles. The Strahman Valve seals itself as a cork seals a bottle. In throttling, the erosive action of the elements passing through the valve cannot have any effect on the sealing surfaces.
Strahman Steam and Water Valves are made of Bronze construction, with Stainless Steel Stem and Piston, assuring long life.
Write direct for complete catalogue
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INC.
STRAHMAN VALVES, INC.,
16 HUDSON STREET, NEW YORK 13, U.S.A.

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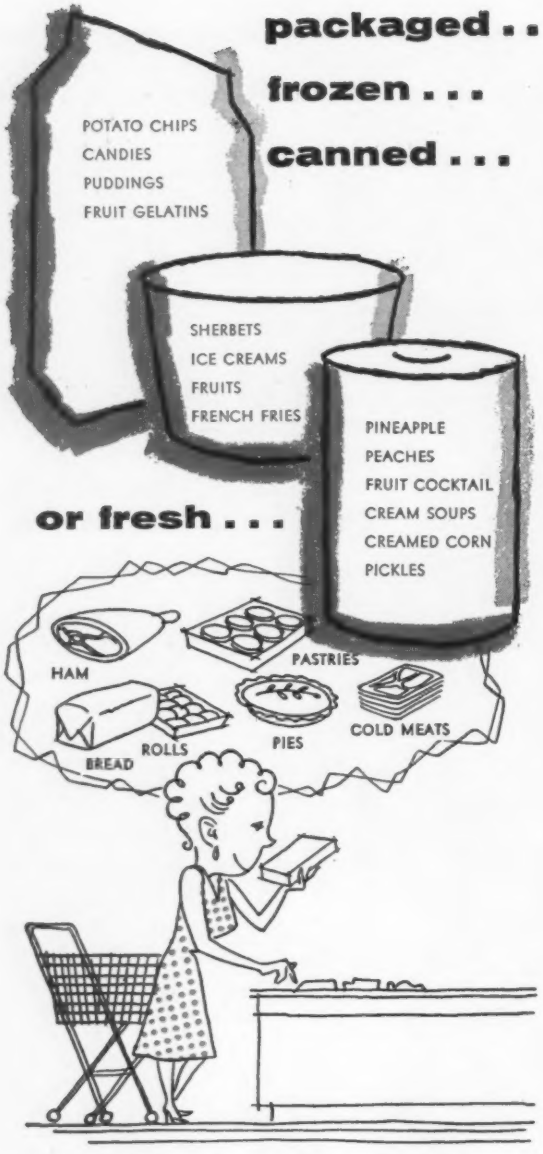


THEY'RE *BETTER* MADE WITH *Clinton*® PRODUCTS FROM CORN

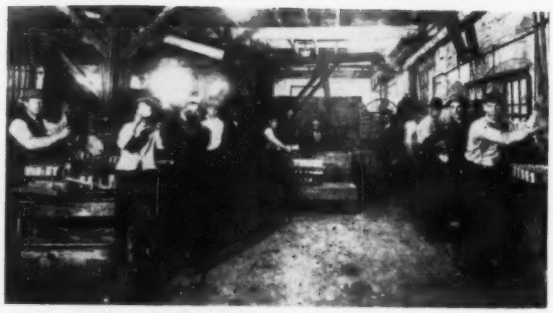
All these food items are enhanced with Clinton products from corn, which include Corn Starch, Corn Syrup and Dextrose, Refined Corn Oil and Lactic Acid. With over 50 years in the corn processing industry, Clinton has both the products and the technical know-how to add more sales appeal to your food items, put more profits in your sales. Call in a Clinton man today!

Quality products

FROM THE WORLD'S CORN CENTER

CLINTON

CLINTON CORN PROCESSING COMPANY
CLINTON, IOWA



Celebrating state's 100 yr. of commercial canning, Californians contrast modern achievements with "canning in the old days," as pictured here. First recorded annual pack in 1863 was 5,400 cases. Today, claims O. R. Hayes, president, Canners League of Calif., the state's yearly output of approximately 217 million cases amounts to nearly ⅓ total U. S. production. Year-long centennial promotion will feature medallion and insignia designed by sculptor Peter Ganine. (Photo, courtesy American Can Co.)

Dr. R. I. Dunlap is now director of research administration, Monsanto Chemical Co., Plastics Div., Springfied, Mass.

Keith A. Fitch has been appointed Kansas City branch manager of Selig Co. He was formerly executive director of Orkin Institute of Industrial Sanitation.

F. Leslie Hart, formerly chief of FDA's Boston district, has joined Truesdail Laboratories, L. A., as food and drug technology director. Appointment follows a WHO assignment to aid Brazil in drafting a food and drug law.

Kenneth M. Hart, marketing manager, Kraft Foods, Chicago, has been elected board chairman of National Assn. of Margarine Mfrs.

John H. Nair, Summit, N. J., retired asst. research director of Thomas J. Lipton, Inc., is now active as a consultant. He is specializing in market research and product-development studies.

Russel H. Winters has been appointed executive v.-p. for sales of National Can Corp.

Industry

Corn Products Refining Co. is shopping for a site for a new plant in Uruguay, as well as stretching its muscles abroad generally. Moves include building a bigger plant in Cali, Colombia, and a completely new plant in Germany, also adding of facilities in Manchester, Eng.

General Baking Co. has purchased assets of Eddy Bakeries, Inc., in Montana. Acquisition will bring total annual sales of parent company to estimated $170 million.

Gordon Foods, division of Sunshine Biscuits, Inc., celebrates 20th anniversary with construction of ultramodern plant in Atlanta. Facility will total over 192,000 sq. ft., nearly four times present space there.

Interior Breweries Ltd. will build $2.5 million brewery at Creston, B. C. Scheduled for production in Mar. '59, annual capacity will be 75,000 bbl.

Tropicana Products, Inc., is name change-over of Fruit Industries, Inc., aimed at keeping grip on valuable publicity and product association. "Tropicana" is brand name under which all company products are marketed.

Associated Industries

Container Corp. of America has opened new $6 million paper mill in Santa Clara, Calif.

F.M.C. International, division of Food Machinery & Chemical Corp., San Jose, Calif., has been appointed exclusive export sales agent for packaging machines produced by **Gisholt Machine Co., Madison, Wis.**

Link-Belt Co. has opened new Los Angeles plant that more than doubles manufacturing capacity of company's former facilities there.

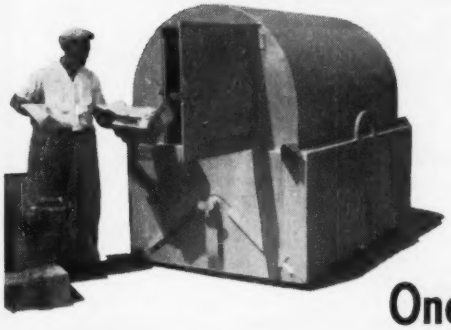
Stokely Van Camp

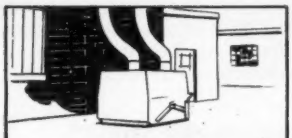
"CONTAINERIZES" Waste as it Accumulates

Newport, Tenn. Plant "Containerizes" Waste and Rubbish at 15 Accumulation Points . . . One-Man, One-Truck Dempster-Dumpster Handles All Collection and Disposal of Materials!

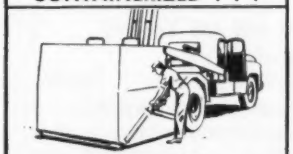
Container at right receives vegetable wastes from washer bins.

Container below is one of several used to collect rubbish.





WASTE IS CONTAINERIZED . . .



. . . PICKED UP . . .

. . . HAULED . . .

. . . AND DUMPED . . .

One-Man Dempster-Dumpster System Serves Many Food Processing Plants

Keeping a food processing plant clean and free of fast-accumulating waste is a critical job . . . one that can't be economically handled by wheelbarrows, cans, bins or carts. Eliminate manual shoveling and rehandling as other industry leaders do by "*Containerizing*" waste, when and where it originates. The secret lies in clean, big-capacity Dempster-Dumpster containers at principal points of waste accumulation, periodically picked-up, hauled and emptied by one man and one truck-mounted Dempster-Dumpster.

The savings are obvious . . . food plants customarily amortizing their Dempster-Dumpster equipment investment in 18 months or less. If you're now using costly, obsolete methods of waste disposal, it will pay you to write for the booklet below.

FREE: Write Today for Your Copy of "How to Reduce Waste Disposal Costs"

DEMPSTER BROTHERS, Knoxville 17, Tenn., Dept. FE-2

THE DEMPSTER DUMPSTER® SYSTEM

To: Dempster Brothers, Dept FE-2
Knoxville, Tennessee

Please Send Without Obligation Your Booklet, "How to Reduce Waste Disposal Costs."

NAME ..... TITLE .....

COMPANY .....

ADDRESS .....

CITY ..... STATE .....

Here's why your best steam trap buy is Yarway Impulse

THERE'S A YARWAY IMPULSE STEAM TRAP FOR EACH OF THESE REQUIREMENTS

As shown opposite, no matter what your need—normal loads, high capacity, low capacity, high pressure, low pressure—Yarway has an *impulse* trap to meet it.

GETS EQUIPMENT HOT FAST—KEEPS IT HOT

Yarway pioneered the application to steam traps of the principle of thermodynamics that makes possible quick heat-up, and high, steady temperatures. Result—peak efficiency from equipment.

ONLY ONE MOVING PART

A little valve is the only moving part. Nothing could be simpler.

LOW MAINTENANCE

Design and material make Yarway Impulse Traps practically trouble-free. A handful of spare parts will service a plant-full of traps.

SMALL SIZE . . . LIGHT WEIGHT

Fit in anywhere. Require no supports or special piping.

GOOD FOR ALL PRESSURES

No change of valve or seat for any pressure up to specified maximum.

NON-FREEZING

Great for outdoor installations. Won't freeze up, because condensate can't accumulate—there's nothing to freeze.

LOW COST

It often costs *less* to install a new Yarway Impulse Trap than to repair a conventional-type trap.

CONVENIENT SUPPLY

Over 270 Industrial Distributors stock and sell Yarway Impulse Steam Traps. One is near you.

NATION-WIDE SERVICE

34 trained Yarway field engineers, located in every corner of the country, give you quick, helpful steam trap service.

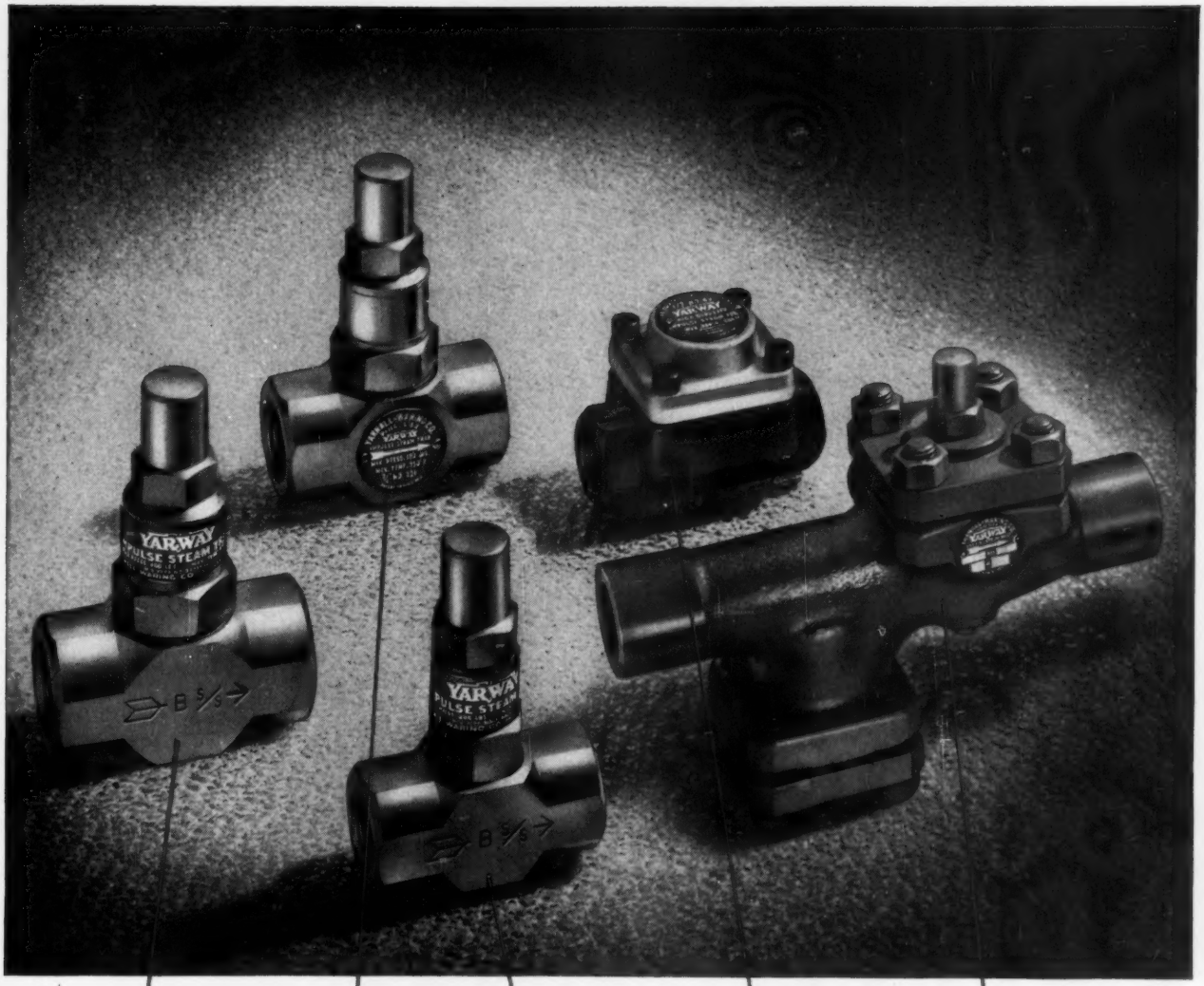
Want the free booklet "Banish Your Steam Trap Troubles" . . . or the Yarway Trap catalog? Write

YARNALL-WARING COMPANY
127 Mermaid Avenue, Philadelphia 18, Pa.

Cross section of Yarway Impulse Steam Trap showing the only moving part, a small stainless steel valve. It actually floats on the condensate load.

more than a million sold!

YARWAY impulse® ...a good



CHOOSE THE RIGHT IMPULSE STEAM TRAP FOR YOUR JOB

NORMAL REQUIREMENTS

Use Yarway Series 60 traps. All pressures to 400 psi and temperatures to 450°F. Six sizes ½" to 2".

HIGHER PRESSURES AND TEMPERATURES

Use Yarway Series 120 traps for pressures to 600 psi and temperatures to 750° F. Six sizes ½" to 2".

LIGHT LOADS

Use Yarway No. 20-A trap where condensate loads are especially light. (Available only in ½" size.)

HEAVY LOADS

Use Yarway Series 40 traps where condensate loads are especially heavy. Five sizes, ½" to 2½".

INTEGRAL STRAINER

For high pressure power plant trapping, also marine use, specify Yarway Integral Strainer Traps. Welding or flanged connections

way to specify steam traps

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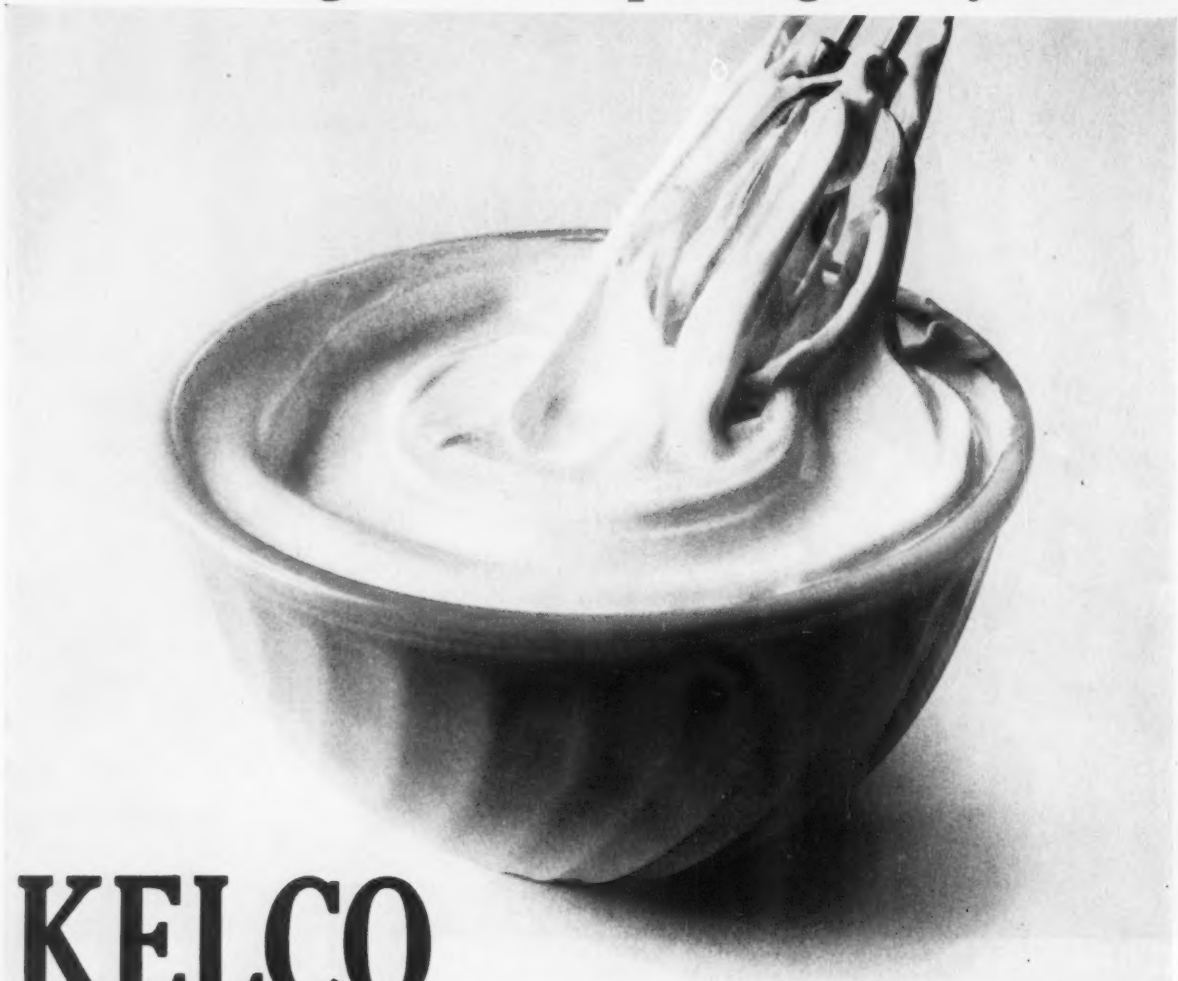
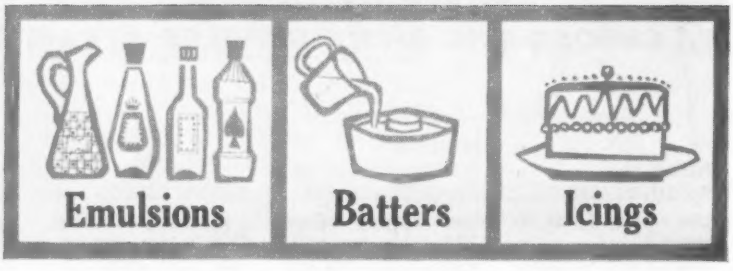
The vital ingredient in packaged dry mixes



KELCO ALGIN

Stabilizes water added to



Include Kelco algins in your instant packaged dry mixes and your customers get desired body and maximum stability in their finished products. Kelco algins make aqueous dairy products whip easier. Icings are retained on cake surfaces with greater gloss and stability. Meringues have finer texture and last longer. Home blended salad dressing emulsions are smoother bodied and have greater stability.

Wherever water, milk or other aqueous media are added to your packaged dry mixes you gain important advantages and benefits in improved body and consistency, more effectively stabilized emulsions, minimizing loss of moisture or migration.

YOURS ON REQUEST: Free samples of Kelco Algin and Technical data describing properties, usages and advantages.

KELCO COMPANY

120 Broadway, New York 5, N. Y. 20 N. Wacker Dr., Chicago 6, Ill. 530 W. 6 St., Los Angeles 14, Cal. Cable Add.: Kelcoalgin — N. Y.

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BOOKS ..... p. 170
PATENTS ..... p. 179
CLASSIFIED ..... p. 183
ADVERTISERS' INDEX ..... p. 187
READER SERVICE ..... p. 190A

NEW EQUIPMENT & SUPPLIES

300-GPM. Centrifuge Offers Double-Nozzle Discharge

Generating centrifugal force, 3,830 times that of gravity, this disk-type centrifuge is designed for efficient clarification and continuous solids discharge while operating at up to 300 gpm.

Known as DH-6 Nozljector, models are available for processing at normal atmosphere, at pressures to 15 psi. (vapor-tight), and to 150 psi. (pressure-tight). They are made of tinned or stainless steel, and powered by 125-hp. motors.

Applications include clarification of liquids containing a relatively high proportion of solids, concentrating solids from a slurry, and separating two immiscible liquids having appreciable insolubles.

Equipped with recycle-type bowls, units also permit high concentration of solids from thin slurries, and thickening of solids into a small amount of the heavier liquid component of a three-phase system.

Because of machine's high feed rate, solids are discharged through two rows of nozzles located around the periphery of the 30-in.-dia. bowl. Nozzles have abrasion-resistant construction for long service life, and can be readily replaced when necessary.

In operation, slurry is fed into the bowl's hollow center tube (photo), where the liquid phase is accelerated to the bowl's speed (3,000 rpm.). Then, liquid rises through holes in a series of disks, which enable separation by stratification. The comparatively narrow spacing between disks provides isolated paths for conducting clarified and separated light phase to outside of bowl.

Separation of components in the bowl is effected by centrifugal force. Solid particles, being the heaviest, are thrown outwardly and discharged through nozzles. A small portion of the heavy-phase liquid, which is also thrown to outer portion of bowl, leaves with the solids.

Balance of heavy-phase liquid goes upward and is discharged through a separate port at top of bowl. Light-phase liquid is forced to inside of bowl where it rises and is discharged through the light-phase port. Suitable covers receive the three effluents, keep them separate, and lead them away.—*The Sharples Corp., 2300 Westmoreland St., Philadelphia.*

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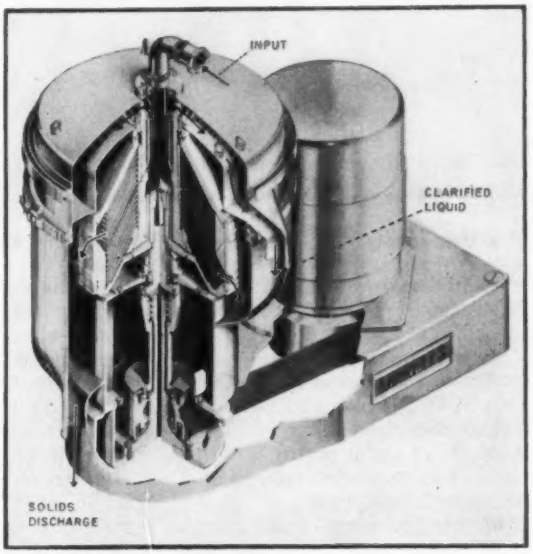
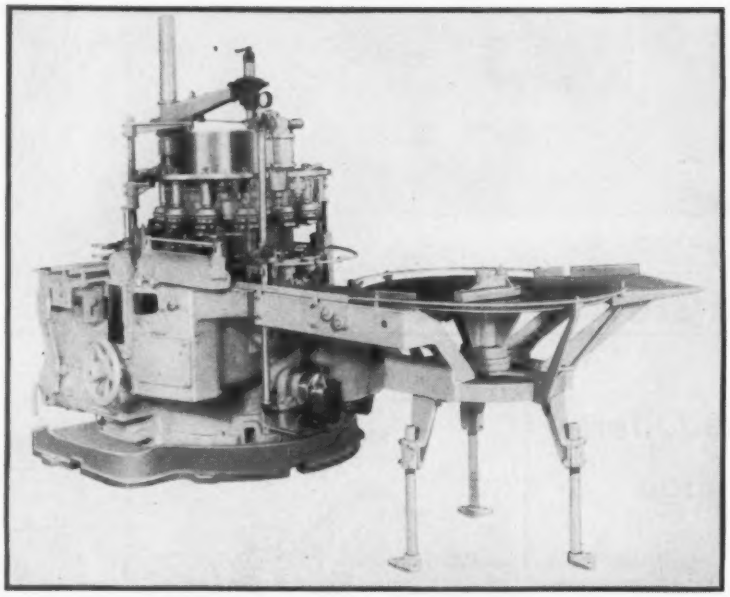


DISK-TYPE operates at 3,000 rpm. for efficient separation and clarification.

Want More Information?

It's free—and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service Postcard—back of book. Then sign at the bottom and mail. For your convenience, too, these items are listed and keyed in the Reader Service Section.

CUT OUT AND FILE



Pre-Vacuumizing Syruper Cuts Operating Costs

This 12-valve automatic machine pre-vacuumizes foods filled in No. 10 cans, then adds syrup or brine.

In addition to guarding product quality by high-vacuum packing, unit (No. 12 PVS) cuts costs. Used with a steam-flow closer, it can save up to 1,000 lb. of steam per hr. and machine's high capacity eliminates need for multiple equipment.

Further economy results from syrup savings (up to 2¾ oz. per can) attributed to extreme filling accuracy, smooth single transfer to the closer, positive valve shutoff, and a "no can-no fill" mechanism. Any syrup in vacuum line is recovered in a trap and is returned to the supply tank.

Here is the syruper's 4-step operating cycle: (1) Exhausting free and entrapped air; (2) filling syrup or brine into container under vacuum; (3) 'topping off' to remove any residual air, and (4) venting to atmosphere and conveying to closer.

Unit has cast-iron frame construction. Its smooth-finish stainless and non-corrosive contact parts are easily accessible for thorough cleaning.—*Food Machinery & Chemical Corp., Canning Machinery Div., P. O. Box 1120, San Jose, Calif., or 103 E. Maple St., Hoopeston, Ill.*

Circle 146A on Reader Service Card

Easier Mounting, Reading Mark New Temp Control

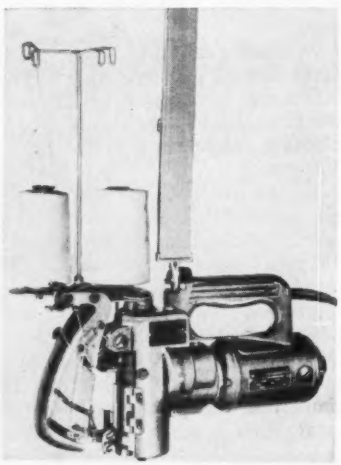
Novel dual-mounting design and greatly improved readability are advantages cited for this new mercury-actuated indicating temperature control.

Offering accuracy to ½% of scale range, unit (Model MFS) senses, indicates, and controls processes in the −30 to 1,100 F. range. Available in 10 scale ranges, its applications include all types of process operations, ovens, cooking kettles, and packaging lines where temperature tolerances are closely maintained.

Special construction (Accu-vision) permits high accuracy in setting and reading. Included are increased dial area, a magnifying setting pointer with two hairlines for parallax sighting, and dial colors combined for greatest possible contrast.

Instrument case may be either flush or wall mounted (from front of panel) without additional brackets. The standard case is made of glass-reinforced polyester in a neutral gray semi-gloss finish, but a wide selection of alternate colors is also available.—*The Partlow Corp., 506 Campion Rd., New Hartford, N. Y.*

Circle 146B on Reader Service Card



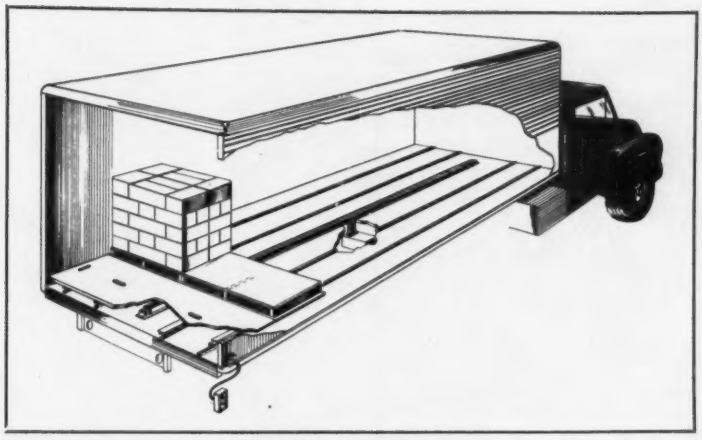
For Limited Production: Portable Bag Closer

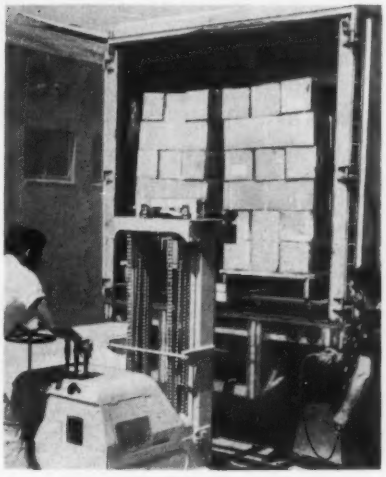
This electric unit offers efficiency and versatility where limited or intermittent operation do not justify installation of a high-production closer. Or it may be used in large plants as a supplemental machine.

Designated Class 2100, unit closes bags made of cotton, burlap, jute, and multi-wall and laminated papers. Stitch types are 401 and 101. Machine employs top feed; integral, direct-driven motor; and protected mechanical thread cutter.

Units may be furnished for hand-portable operation or suspension by top lock-spring balancer. Or a pedestal bracket can be supplied.—*Union Special Machine Co., 400 N. Franklin Street, Chicago.*

Circle 146C on Reader Service Card





Trailer's Pushbutton Floor-Conveyor System Speeds Handling of Palletized Loads

Loading and unloading time for vans or trailers reportedly can be cut 50% with use of a novel pushbutton-activated electric floor-conveyor kit.

Called "Moto-Vator," it mounts to the floor of the vehicle and 'walks' palletized loads in or out of the body. Installation is said to be simple and fast.

The kit consists of:

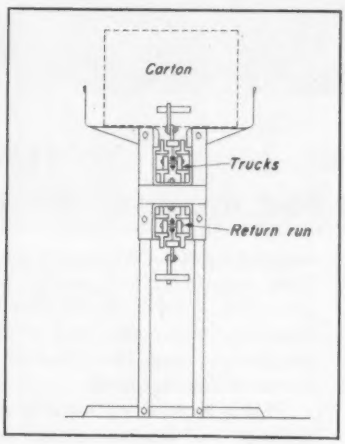
1. Conveyor-chain channel assembly running full body length and powered by 12v. battery motor (or optional 110v. system).

2. Four aluminum tracks, two on each side of channel assembly, also running full body length.

3. Floor segments made of thick, stressed plywood fastened to rollers in the tracks. They are of body width and can range 24-36 in. deep.

In addition to the four sets of rollers on underside of floor segments, there is a hook that engages the conveyor chain to move segments back and forth. Latter act as a false floor on which pallets are placed.—*H. S. Watson Co., 1316 67th St., Emeryville, California.*

Circle 147A on Reader Service Card



Unique Conveyor Incorporates 3-Dimensional Runs

Here's a single conveyor system designed to replace multiple power belts that run horizontally, make turns, and go up or down steep grades. Gentle handling and low maintenance costs are cited as additional advantages.

Called Multi-Veyor, it accomplishes this conveying with a single drive, and without belts, live rollers, or transfer points.

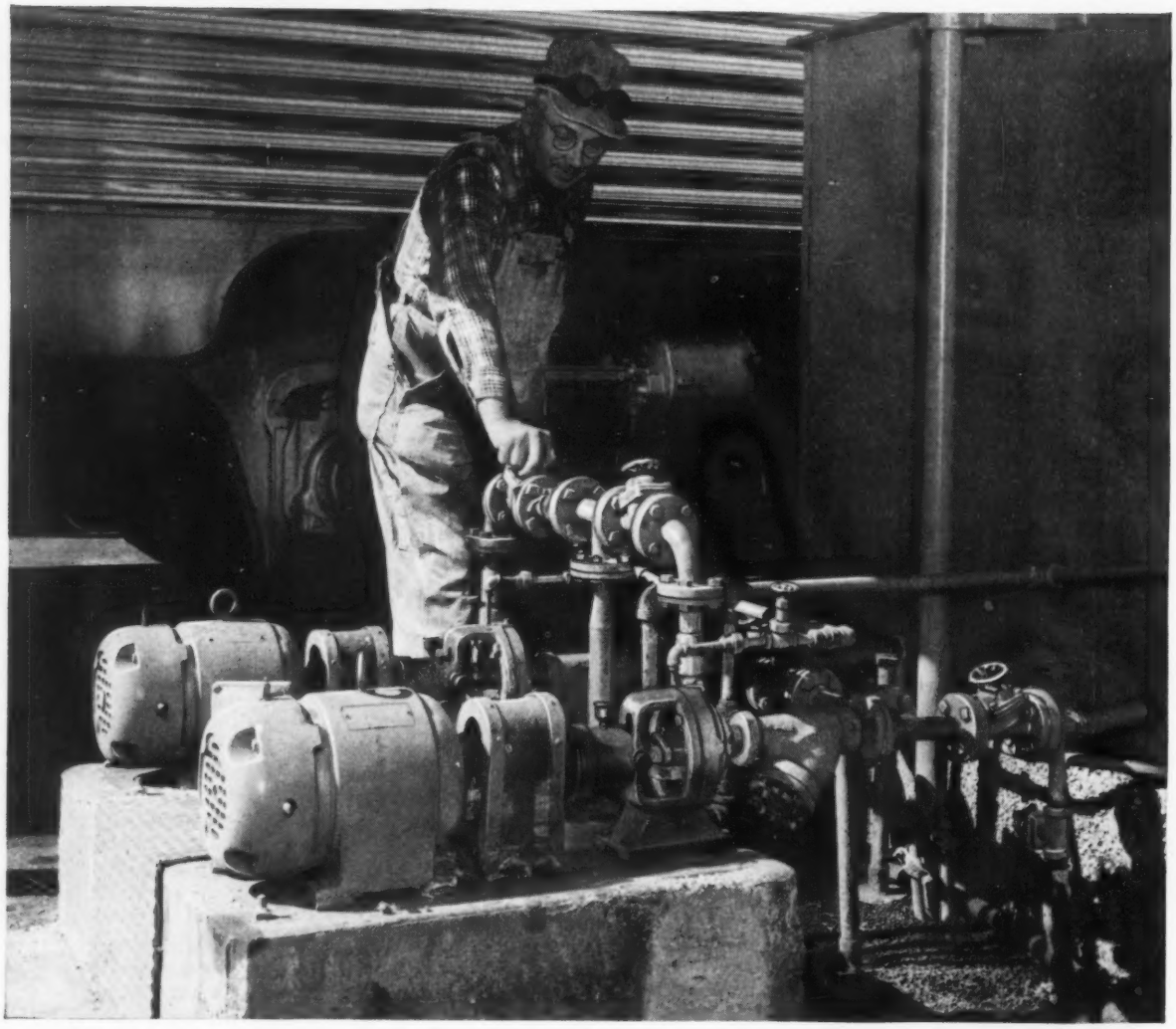
Unit consists of a series of small trucks connected by steel linkages to form an endless chain (diagram). Trucks are guided by full-rolling contact in the track, and are driven by caterpillar-type device. A steel slider or roller bed for articles to be conveyed is carried above the track. Pushers extending up from trucks engage cartons and propel them along the slider bed at any desired speed.

Trucks' return run is tucked under the loaded run when entire length of both is not needed. Thus the return run can be directed over a different path from the loaded one and used as an overhead conveyor.—*Econoveyor Corp., 224 Glen Cove Ave., Glen Cove, N. Y.*

Circle 147B on Reader Service Card

Ingredients p. 153
Chemicals p. 154
Briefs p. 156
Equipment Applications p. 158

How to cut costs with Crane valves



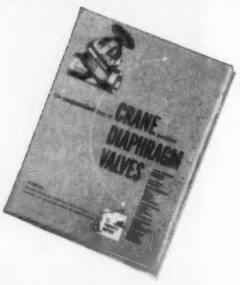
30,660 operations on tough corrosive— and not a penny for maintenance

This case history may give you an idea how to save money in your own plant.

The man above is operating Crane 1-inch diaphragm valves on lines to a railroad car washer, used by a mid-western railroad in its Los Angeles yards.

These are Crane No. 1631 valves with neoprene diaphragm and disc insert, and with 18-8 SMo bodies. Handling an acidic cleaning solution, these valves have been operated 12 times a day, 365 days a year for over 7 years. Yet despite the corrosive fluid, despite the long periods of frequent operation, none of these Crane valves has leaked . . . none has had a diaphragm rupture . . . none has required a penny's worth of maintenance.

This is another example of how Crane research and product design help industry avoid costly valve maintenance. For information on any valve application, call in your Crane Representative.



YOU'LL WANT THIS Crane Folder AD-1942 on packless diaphragm valves. Ask your Crane Representative for a copy, or write to Crane Co. at address below.

CRANE VALVES & FITTINGS

PIPE • PLUMBING • KITCHENS • HEATING • AIR CONDITIONING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

Self-Aligning Union Offers Unique Seal-Ring Design

Now available for both CIP and take-down lines is a complete line of new stainless-steel unions.

Called Para-Seal, units are said to be self-aligning, rigid, and virtually immune to vibration and distortion. Unique seal-ring design affords metal-to-metal closure with flush inner surface. A rubber seal is permanently bonded to the backing ring, and cannot be over-compressed or cut.

Self-alignment of seal ring and controlled compression of the rubber extend gasket life.—*APV Co., 147 Arthur St., Buffalo, N. Y.*

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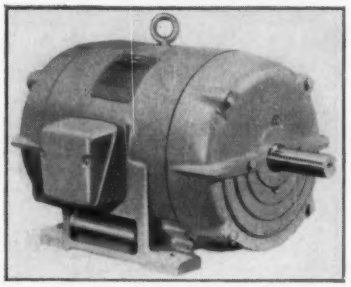

Induction Motor Operates At Synchronous Speed

Reportedly the first synchronous induction motor built in the same NEMA frame size as a standard motor of equal horsepower, this unit accelerates as an induction motor but runs at exact synchronous speed.

Called Syncro-Spede, it operates without permanent magnets or d.c. excitation equipment. Suitable for many applications requiring constant speed with varying load, this compact a.c. motor offers high power factor and efficiency. And because of its size, it provides precise frequency systems in small generator ratings.

As a conveyor drive, unit enables an exact constant-speed or adjustable-speed system from no-load to full-load with minimum driving units and controls. Unaffected by voltage fluctuations, it is also well suited for precision timing and metering devices, and recording instruments.

Unit is available in 1-100 hp. ratings in any enclosure type. It can be foot- or flange-mounted. Either horizontal or vertical mounting is possible and a wide range of mechanical modifications is available to meet specific requirements.—*Louis Allis Co., 427 E. Stewart St., Milwaukee.*

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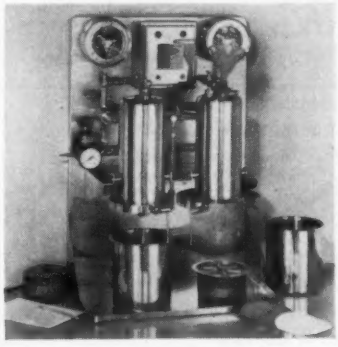

Rapid Filtration Provided By Automatic Lab Unit

Quality-control testing and research may be sped and simplified with use of this filtration unit for light or heavy precipitates.

Known as Spincraft Automatic Speedfilter, it consists of two, 3.5l. tanks used independently or together. Pressure (0-25 psi.) may be pre-set and unit automatically completes the filtration. A mercury switch then shuts off the pressure.—*American Hospital Supply Corp., Scientific Products Div., 2020 Ridge Ave., Evanston, Ill.*

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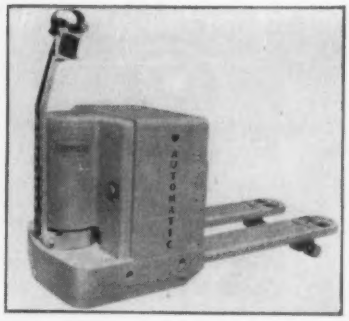

Low-Lift Truck Provides 50% More Battery Space

The wider battery compartment in this new line of low-lift trucks affords 50% more space.

Units (Transporters, Models WPY-4 and 6) are available in 4,000 and 6,000 lb. capacities respectively. Use of larger batteries is particularly important when equipment is operated under heavy current-draw, such as on steel ramps, and where work is continuous at full capacity.

Despite the larger battery compartment, units measure only 29 in. plus length of load. Maximum steering angle is 200 deg., affording excellent maneuverability in narrow aisles.

For simple maintenance, removal of two hand screws holding a steel cover exposes the power unit. Maintaining the gear-case oil level is the only lubrication required in the power head, and adjustments of brakes and electrical components can be made quickly. Greasing at only three points permits lubrication of all other load-bearing surfaces.—*Automatic Transportation Co., 149 W. 87th St., Chicago.*

Circle 149D on Reader Service Card

New Stainless Tubing Meets High Sanitary Standards

Now available to the food industry is a seamless stainless tubing specially developed to meet rigid sanitary requirements.

Known as Lustraloy, the mandrel-drawn product also offers free flow and high corrosion resistance. It is produced in sizes from ⅜-1½ in. o.d., and 0.020-0.109 in. wall thickness.—*Columbia Steel & Shafting Co., Summerill Stainless Tube Div., Carnegie, Pa.*

Circle 149E on Reader Service Card

ONLY TWO MOVING PARTS IN THE LIQUID

Now you can achieve fine-instrument accuracy in the processing of corrosive liquids . . . in batching, blending, transfer, cost accounting, etc. . . . with this new Neptune Stainless Steel Meter.

Also important in many processes, this Neptune meter ends many problems caused by contamination of liquids being measured.

Based on the reliable Neptune positive displacement principal, its accuracy is completely protected from the effects of corrosion or corrosive wear. There are only two moving elements in contact with the liquid. The gear-train is mounted outside the casing, isolated from the liquid.

Available with Direct Reading, Print-O-Meter or Auto-Switch Registers. Size 1½", capacity 100 gpm. with most liquids.

Ask for Bulletin 94/10 PF

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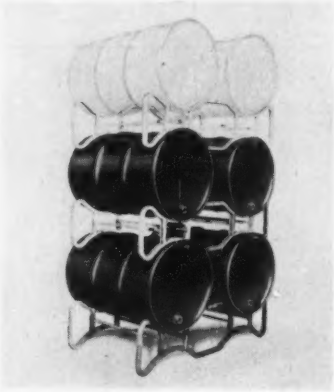

Compact Drum Rack Offers Flexible Handling, Storage

This heavy-gage steel rack boosts drum handling and storage efficiency by permitting easy stacking with standard fork-lift trucks.

Compact unit supports 7,500 lb. in 18-gage drums and 14,000 lb. in 16-gage drums. Containers can be stacked to any practical height, and individual drums or pairs are readily removed without excessive handling of others in the stack. A two-drum lift may be made from the front, back, or either side.

Racks are enameled to curb rusting and are shipped knocked down.—*Republic Steel Corp., Pressed Steel Div., 6100 Truscon Ave., Cleveland.*

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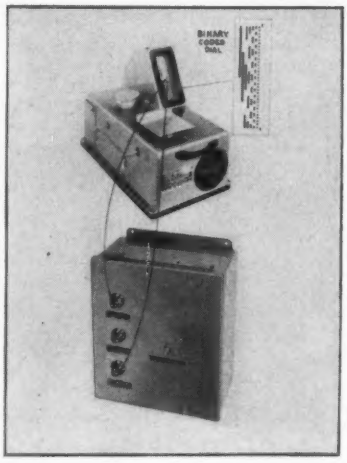
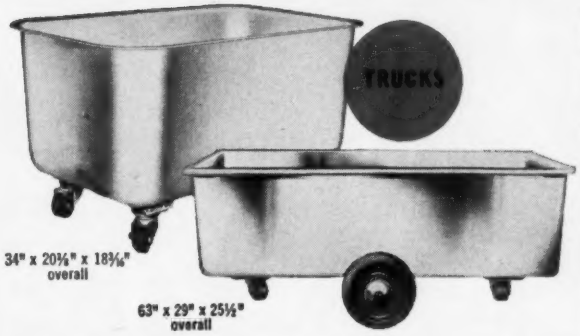


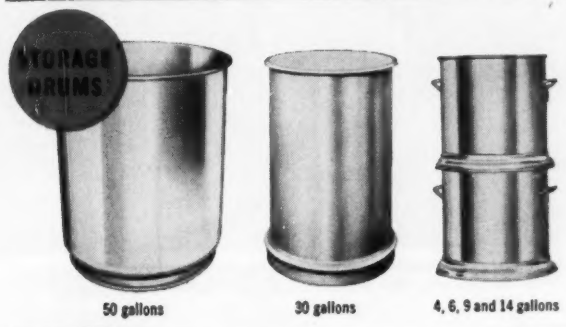
Precision Scale Inspects Open, Closed Packages

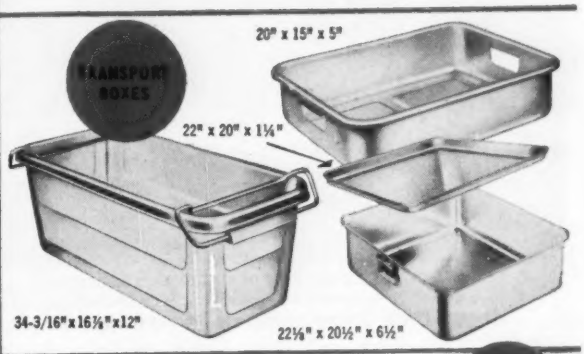
Designed for classifying and process control of products and packages by weight, this unit inspects open or

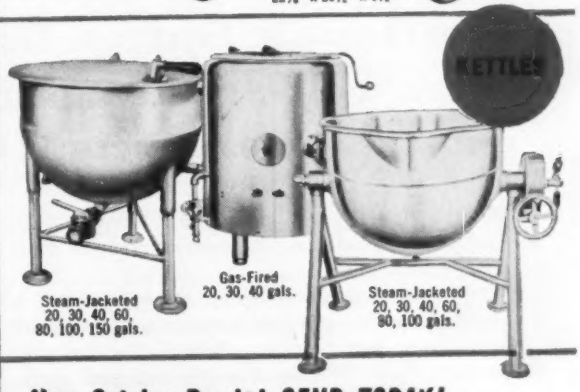
Leaders in Aluminum . . . for the *FOOD* Industry

WEAR·EVER ALUMINUM









Want to speed production? Simplify your handling or storage problems? Standard, readily available items like these may be your answer.

All Wear-Ever plant service items are made from a specially developed, tough, hard-wrought aluminum alloy to assure long service life.

Send for your copy of our catalog showing the full Wear-Ever line.

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The Aluminum Cooking Utensil Company, Inc.
302 Wear-Ever Building, New Kensington, Pa.

GENTLEMEN: *I'd like to learn more about ways in which Wear-Ever's line can help me.*

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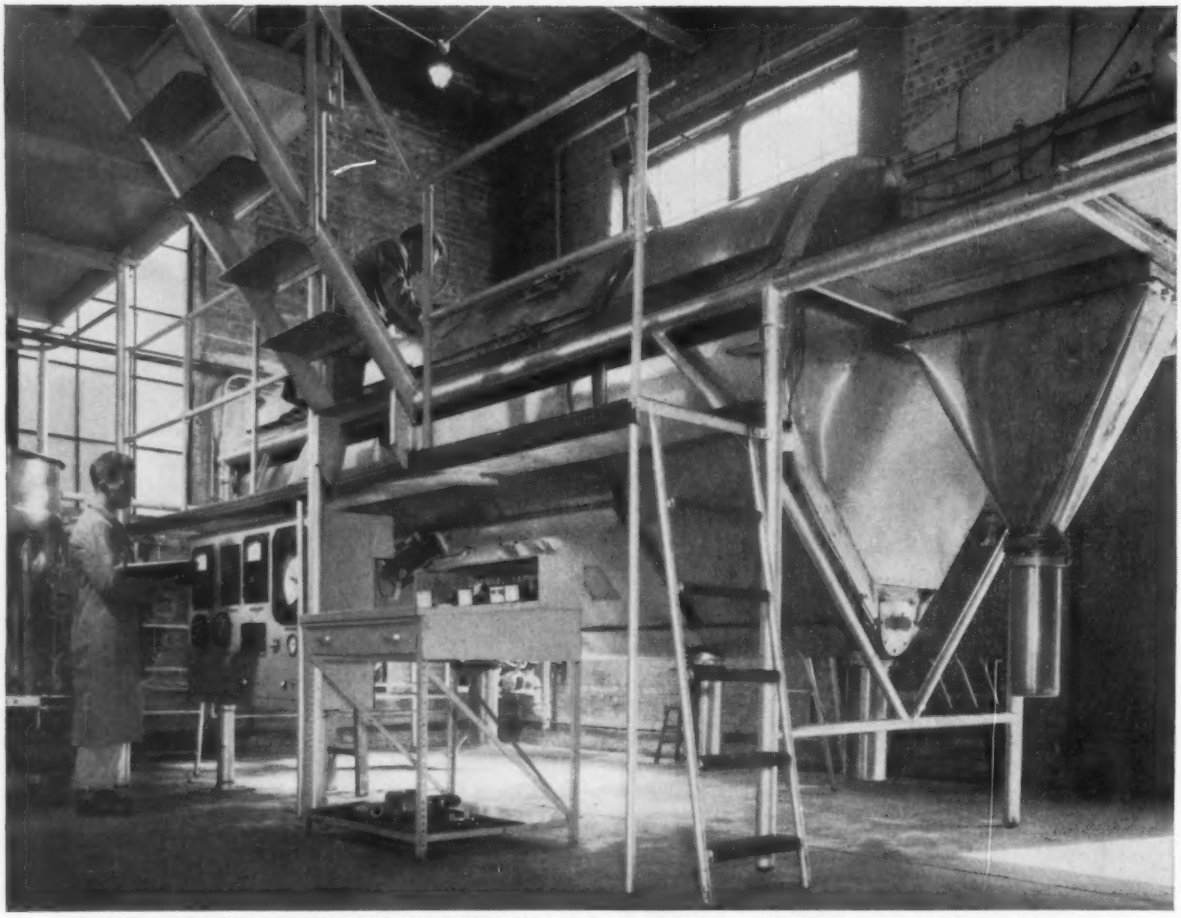
THE ALUMINUM COOKING UTENSIL CO., INC., NEW KENSINGTON, PA.



RUNNING SPRAY DRYING TEST IN BUFLOVAK'S PROCESSING LAB. The lab contains a complete line of small scale and pilot size processing equipment for investigating drying, evaporation, extraction, impregnation, crystallization, and other processes. Here you can test a few beakers of material or run tank car quantities on a full time production scale.

Buflovak Spray Dryers—new horizontal high velocity design for instant drying... improved products...lower operating costs

Whether it's food or chemicals, Buflovak flash drying gives products new, more marketable characteristics.

Buflovak Horizontal Spray Dryers convert a liquid to a dry product instantaneously. Short exposure to heat helps to retain all the desirable product characteristics. Particle size and shape can be selected and controlled. The finished product is continuously removed and discharged from one point.

Compactly designed, these dryers require little headroom, keep initial and operating costs low. Complete accessibility makes between-batch cleaning easy and economical. Buflovak Spray Dryers offer a choice of high efficiency powder collecting systems best suited to your product.

Test your product in the Buflovak customer service laboratory

It's easy to check your product by running a test in the lab spray dryer. Here you can work with skilled engineers to obtain accurate performance data and actual samples of your spray dried product . . . see particle characteristics . . . examine process efficiency.

Contact Buflovak's research department for details on the facilities and services available to you.

BLAW-KNOX

BLAW-KNOX COMPANY
Buflovak Equipment Division
1631 Fillmore Avenue, Buffalo 11, N.Y.

closed packages for correct contents.

Known as Basic Weight Classifier, it employs adjustable photocells mounted adjacent to the visual dial on the Shadograph scale. They provide a reliable electric signal when pre-set weight limits or allowable tolerance settings are reached. Scale is offered in 34 models, capacities ranging from 2,000 mg. to 100 lb. Commodity receptacles and platters are available to accommodate any size or shape product.

Two or more photocells can be used for any number of classifications from 2 to 128. Multiple classifications are accomplished with a projected binary coated 'gray' scale dial (photo) mounted on the weighing mechanism. Use of photocells doubles the scale accuracy.

A controller used with the scale operates relays to open and close circuits when proper weight is reached. It may be used to actuate automatic transfer mechanisms, operate counters, visual signal lights, or alarm signals. In addition, it actuates visual chart recorders for statistical quality control.—*Exact Weight Scale Co., Columbus, Ohio.*

Circle 150B on Reader Service Card

INGREDIENTS

Many Applications Cited For New Emulsifier

Hydrophilic activity of a new liquid surfactant (made from CP glycerine and refined edible vegetable oil) offers numerous applications.

Having bland flavor, product (Sole Onic PGE) is a versatile, easy-to-handle emulsifier for ice cream, margarine, and shortening. As an anti-foam, it is particularly useful for cooking and evaporation of syrups and preserves. In bakery specialties, it enhances surface-active properties of fats and oils, coatings, icing bases, fillings, and flavor emulsions.

Furthermore, product's bland flavor permits its use in beverage bases and vitamin concentrates containing oil-soluble components.

As with most unsaturated fatty derivatives, this product can be protected from rancidity by antioxidents (BHA and BHT). Propyl gallate should not be used where color is a factor, since it tends to darken the emulsifier.—*Sole Chemical Corp., 27 E. Monroe St., Chicago.*

Circle 153A on Reader Service Card

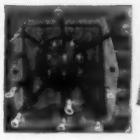
REEVES® *Vari-Speed MOTODRIVE*

● Put a halt to high replacement costs in corrosive atmosphere with this complete variable speed power package . . . by REEVES.

Available from ¼ through 5 hp., the 100, 200 and 300 size Motodrives are resistant to most acids, gasses and corrosive dusts. They feature a wide speed range . . . up to 10:1 with gear ratios from 1.17:1 to 195:1 . . . and provide infinitely variable speeds in hundreds of standard assemblies to fit nearly any space requirement.

Corrosion-Proof Disc Assemblies
Corrosion resistant cast iron; Exclusive REEVES "close grooving"—for positive disc lubrication.

Corrosion-Proof Gear Reducers
Cast iron gearbox and head; shaft oil seal—double tip neoprene; leak proof vent plug.

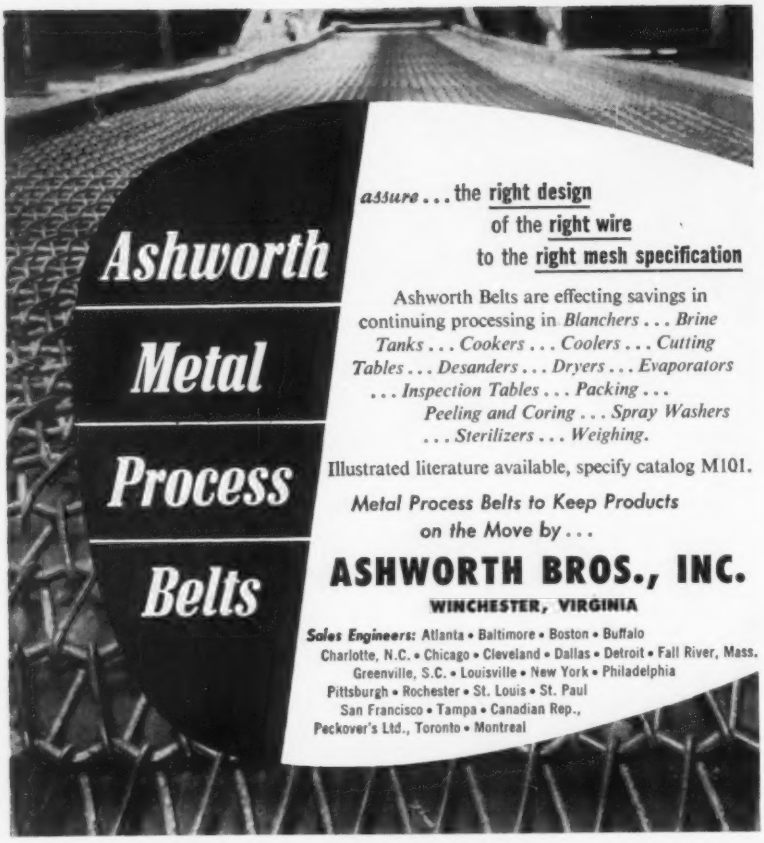


Corrosion-Proof Motor
Solid cast iron housing and fan—fully sealed cast iron conduit box—motor lead gasket seals off motor windings.

Fully sealed cast iron Motodrive case and inspection plates protect operating internals—lifetime stainless steel nameplates and identification plates—zinc plated Hexhead capscrews throughout. Write for Bulletin FE34-M578.

REEVES PULLEY COMPANY
Division of **RELIANCE** ELECTRIC AND ENGINEERING CO.
Columbus, Indiana

For more data, circle this page number on card at back →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of the right wire
to the right mesh specification
Ashworth Belts are effecting savings in continuing processing in Blanchers . . . Brine Tanks . . . Cookers . . . Coolers . . . Cutting Tables . . . Desanders . . . Dryers . . . Evaporators . . . Inspection Tables . . . Packing . . . Peeling and Coring . . . Spray Washers . . . Sterilizers . . . Weighing.
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AUTO-LITE
TEMPERATURE RECORDING . . .
Newly designed, Model "1000" Auto-Lite Recorder gives permanent proof of temperature behavior. • 6" clear reading chart; various standard ranges from minus 40°F. to plus 550°F. • 3 standard types; choice of 24-hr. or 7-day cycle. • Electric or mechanical chart drive. • With capillary tubing for remote reading. Priced from $49.50.
Send for new catalog describing many styles of Auto-Lite temperature Recorders and Indicators.
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Equipment & Supplies

Modified Starch Prevents Frozen-Food 'Weeping'

A new tasteless modified starch reportedly eliminates "weeping" and other adverse texture changes in precooked frozen foods. Thus it is seen spurring development of products that formerly were unacceptable because of defects in the starch.

Called Freezist, it is recommended as a base thickener in frozen sauces, gravies, desserts, fillings, soups, and baked goods. Such foods retain fresh-cooked taste and appearance, even after extended storage and varying freeze-thaw conditions, also take less time for reheating.

Starch dispersions are compatible with all food acids. Glossy, short-textured, and smooth, they are particularly useful in products requiring clarity and smooth texture.—*Morningstar, Nicol, Inc., 630 W. 51st St., New York City.*

Circle 154A on Reader Service Card

CHEMICALS

Mineral Coating Guards Low-Temp Insulation

Sanitation and appearance of low-temperature insulation in processing plants and warehouses may be improved with a new coating.

An all-mineral compound (Koldrok), it provides a seamless, durable surface that is fireproof and easy to clean. Available in a range of colors, product is applied by trowel in a thin coat over new or exsiting surfaces.—*Selby, Battersby & Co., 5210 Whitby Ave., Philadelphia.*

Circle 154B on Reader Service Card

New Floor-Patching Agents Packaged for Easy Use

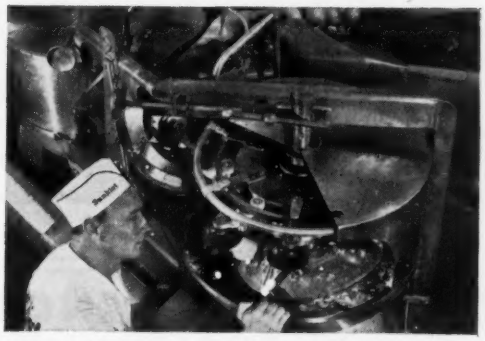
Food-plant floors may now be easily repaired with new patching materials conveniently unit packaged in a 2½-gal. container.

Called Chemi-Patch, product consists of aggregate, catalyst, binder, and smoothing agent. It provides a durable, non-slip surface, which is self-bonding, self-curing, and has three times the compressive strength of concrete. Patched areas will not absorb fats, oils, or bacteria.

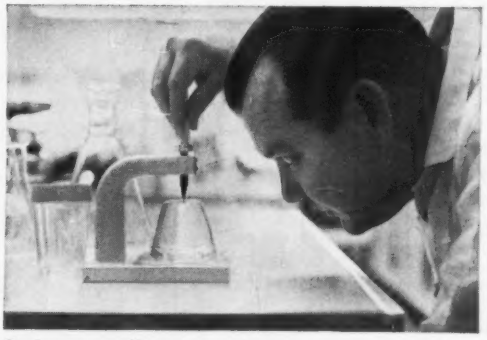
In operation, binder and catalyst are mixed in the 2½-gal. can, aggregate is added, and material is

One look at the huge, sprawling buildings at one of the Exchange Products plants and you know that big things are happening inside. For here *citrus* is king. Trucks pour in with fresh fruit from groves all over California and Arizona. Conveyer belts hum along in every direction. And Exchange products are shipped to nearly every part of the world.

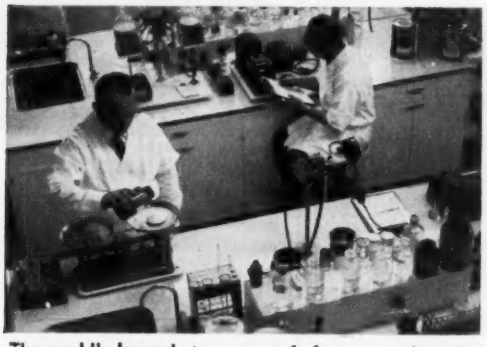
Why 'Exchange' products serve you better



Utmost cleanliness is the watchword at Exchange Products plants. Everything has that "just washed-down" look. Every four hours, extraction equipment is completely cleaned. Every third day, the entire plant closes down for a thorough washing.



Exchange quality is assured by constant checking in extensive testing laboratories. In fact, rigid quality controls have been set up *throughout* the plant to make sure that every product measures up to Exchange quality. Sunkist produces more than 400 different citrus products.



The world's largest citrus research department is maintained by the Sunkist Growers to develop new growing methods, to improve manufacturing processes, and to perfect better products. Today, with a backlog of more than 60 years experience, Sunkist has accounted for 118 separate U.S. patents.

Just three of many Exchange products are *Exchange Preserver's Pectin*—guarantees a more uniform finished product; *Exchange Low Methoxyl Pectin*—jells *without* sugar, tasteless, controls "weeping" in pies; *Exchange Lemon Juice*—brings out natural flavor of *any* food. Superior acidulant, excellent anti-oxidant.

Sunkist Growers

PRODUCTS DEPARTMENT • ONTARIO, CALIFORNIA

Distributors for

Exchange Lemon Products Co., Corona, Calif. • Exchange Orange Products Co., Ontario, Calif.

For more data, circle this page number on card at back →

Highly Intimate Blends in 1 to 2 Minutes

Blends while discharging; No segregation or flotation

Sturtevant Rotary Blenders start 4-way blending while charging, continue it during discharge, thus producing highly intimate, even blends of dry and semi-dry materials – within 3 to 5 minutes of start of charging.

Six *complete* blending cycles per hour are common. And Sturtevant's special action produces no particle reduction, cleavage or attritional heat – is highly effective yet gentle and safe even with explosives.

Receiving

Scoops cascade material as drum rotates. Movement forces material from both ends to middle. Thus blending is 4-way right from start of charging.

Discharging

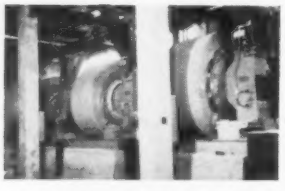
Single gate controls charge, discharge. Blending continues throughout discharge phase. Result is no segregation or flotation — highly intimate, even blends.

Self-cleaning, dust-sealed drum; one-man accessibility

Operation of Sturtevant Blenders is self-cleaning – drum interiors are completely dust-sealed. For inspection of all models, one man simply loosens a few lugs to remove manhole cover – quickly and easily.

Nine standard models with capacities to 900 cu. ft.

10 cu. ft. Sturtevant Stainless Steel Blender at U.S. Steel's Applied Research Laboratories. Corrosion and contamination-proof, this unit handles batches up to 500 lbs. — is ideal for critical work or small runs.



Automatically controlled, three 50 cu. ft. Sturtevants blend chocolate powder and other ingredients for Hershey Chocolate Corp. Operating in a group, each Blender can process more than a ton per batch. Quick accessibility and self-cleaning features keep maintenance to one hour per week.

Fully or semi-automatic, or manually controlled operation

Constructed of carbon steel, stainless steel or Monel metal, Sturtevant Rotary Blenders are engineered to fit each customer's needs – can be supplied with injector sprays and any desired control system.

For more on Sturtevant Blenders, request Bulletin No. 080B. (Bulletins also available on Mixers, Air Separators, Micronizers, Crushers and Grinders.) Write today. STURTEVANT MILL CO., 106 Clayton St., Boston, Mass.

Equipment & Supplies

ready to apply. Surface is prepared by wire-brushing (if necessary) to remove loose particles, then product is applied by a trowel. Finishing is achieved by dampening an ordinary paint roller with the smoothing agent.

Floor is ready for light traffic in 18-24 hr., for heavy traffic in about 36 hr.—*The Garland Co., 3748 E. 91st St., Cleveland.*

Circle 154C on Reader Service Card

BRIEFS

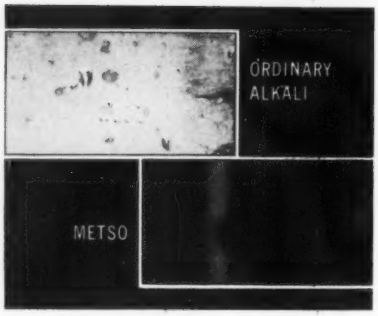
High-Speed Wrapper for frankfurters turns out 27-75 plastic-wrapped packages per min. (single or double-row) using only a supporting card. Unit (Model F) has 12 feeding stations and conveyor extensions are available. Floor space required: 144x73 in.; height, 55¼ in.; drive, ½-hp. motor.—*Wrap-King Corp., 100 Berkshire St., Holyoke, Mass.* (156A)

Linear Electron Accelerator, for sale or lease, permits food-preservation research and limited commercial radiation processing. Traveling-wave device (Mark 1-F4) is 12 ft. high, and emits high-energy electrons, X-rays, or neutrons. Electron beam, ranging 2-10 mev., penetrates up to 1¼ in. from one side. At full power (4 kw.), it processes up to 3,000 megarad-lb. per hr.—*Applied Radiation Corp., Walnut Creek, Calif.* (156B)

Versatile Continuous Mixers (capacities to 100 tons per hr.) cut production costs when used with automatic feeders. Units produce uniform blends with such items as flour, cereal products, fondant, and starched jelly.—*William A. Anthony Engineering Co., 6886 Pearl Rd., Cleveland.* (156C)

Test Chamber duplicates and accurately sustains almost any climatic condition for checking food stability and effectiveness of packaging. The 9.6-cu. ft. unit (Climate-Lab) is of stainless steel, with controls accurate to 1% R.H. and 1 deg.F. Chamber provides atmospheres up to 99% R.H. and 160F.—*American Instrument Co., Silver Spring, Md.* (156D)

Automatic Precipitator Control, for dust separation with Cottrell units, employs advanced 'sensing' principle to continuously adjust applied voltage to fluctuating characteristics of



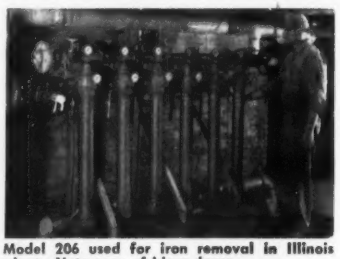
HOW **METSO** AVOIDS WATER BREAKS

Glass panels above were coated with mayonnaise and soaked for 5 minutes in 2% alkaline solutions at 100°C. Note: no water clings on the Metso panel, because it is cleaned free of grease.

Send for free folder, "Cleaning in Food Industries with Metso Detergents" and name of the nearest distributor.

PHILADELPHIA QUARTZ COMPANY
1148 Public Ledger Bldg., Philadelphia 6, Pa.
Trademarks Reg. U.S. Pat. Off.
METSO DETERGENTS
9 PLANTS • DISTRIBUTORS IN OVER 65 CITIES

RONNINGEN
Cost-Conscious Fluid Filters



Model 206 used for iron removal in Illinois plant. Note ease of blow down.

Eliminate down time on your filters and strainers. Continuous operation; no standby needed. Multiplex filters; one unit can be removed from line for service, and all the others continue to operate. Can be blown down and back-washed in a matter of seconds.

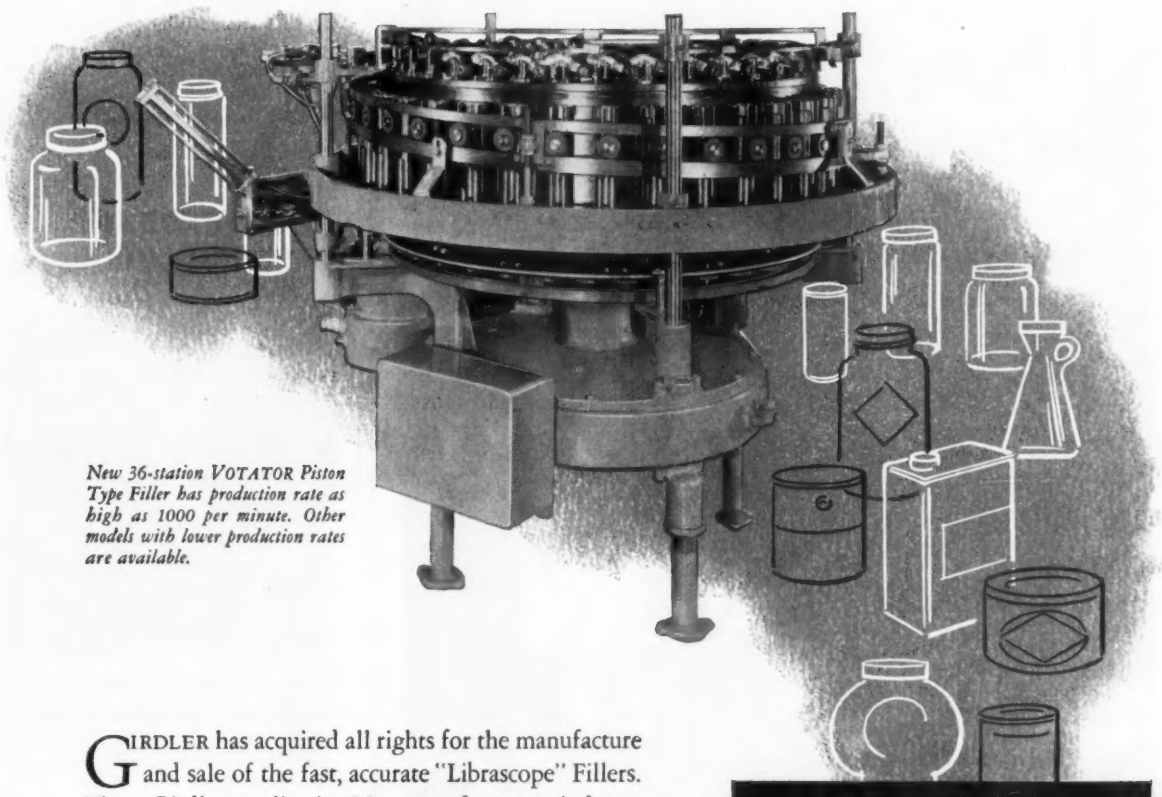
Quick coupling—non short-circuiting—sealed both ends. Bronze casting with monel metal screen; also all 316 stainless steel; also steel. 10 to 3000 GPM. Pressures to 300 PSI. Liquids hot or cold.

Write for Bulletin #45570, Dept. F
STRAIN AGAIN WITH RONNINGEN
"Particles large or small, we filter them all"

RONNINGEN-PETTER CO.
Vicksburg, Michigan Phone Midway 8-5161
Representatives throughout U. S. and Canada

ANNOUNCING THE NEW VOTATOR FILLER

for continuous, high-speed, accurate packaging



New 36-station VOTATOR Piston Type Filler has production rate as high as 1000 per minute. Other models with lower production rates are available.

GIRDLER has acquired all rights for the manufacture and sale of the fast, accurate "Librascope" Fillers. Thus, Girdler applies its 30 years of process industry experience and its precision-production facilities to bring you high standards of packaging economy.

By adding this new line of VOTATOR Fillers to its line of VOTATOR* Heat Transfer Apparatus, Girdler affords many manufacturers a closer integration of processing and packaging operations.

The new VOTATOR Fillers have distinctive improvements for more profitable packaging of many liquid and viscous products. They are fully described in Bulletin PED 257, free on request.

*VOTATOR – Trade-Mark Reg. U.S. Pat. Off.

GIRDLER

PROCESS EQUIPMENT DIVISION

NATIONAL CYLINDER GAS COMPANY

Louisville 1, Kentucky

Manufacturers of VOTATOR and THERMEX Processing Apparatus

Sales Offices: Louisville, New York, Chicago, Atlanta, San Francisco

For more data, circle this page number on card at back →

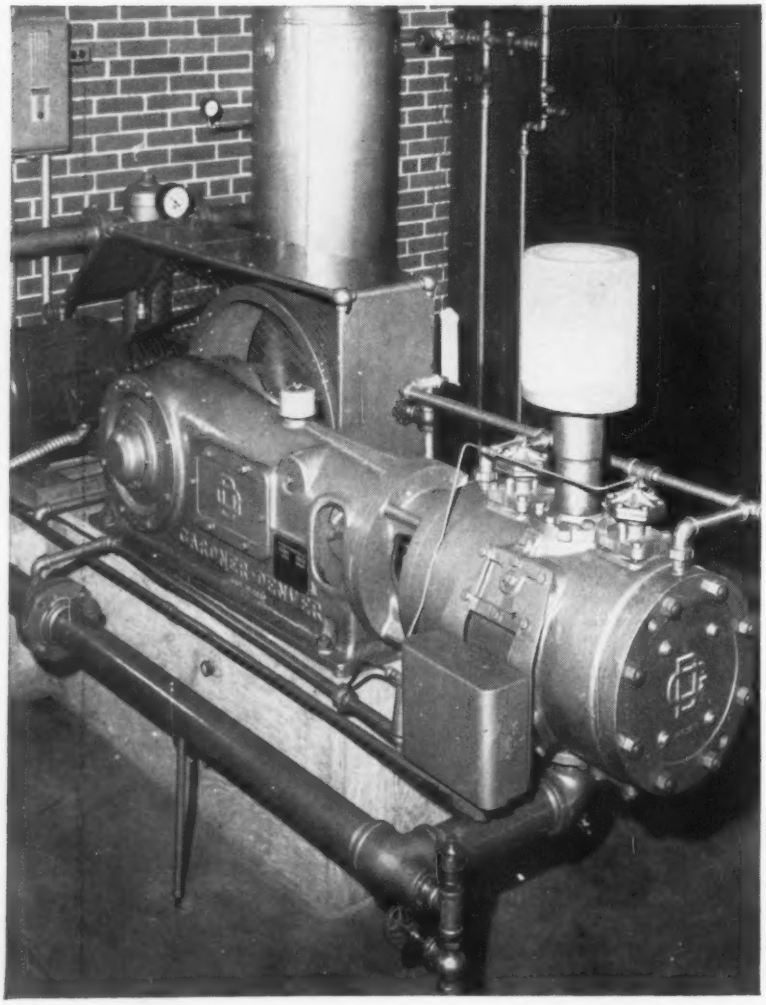
GARDNER DENVER

Pure, oil-free air for processing or instrumentation—that's what you can depend on from the Gardner-Denver CRX compressor. That's because carbon parts in the cylinder—piston, piston rings, packing rings—are made of self-lubricating carbon. No oil or water lubrication is required. Correct cylinder and valve design keeps efficiency high, power cost low. Send for Bulletin CRC-10 today and learn the details.

Stationary air compressors . . . tank-mounted compressor outfits . . . oil-free air compressors . . . whatever your compressed air needs, see your Gardner-Denver compressor specialist first. Gardner-Denver Company, Quincy, Illinois.

Pure, oil-free air

CRX Carbon Piston Compressor



Equipment and Supplies

gas stream. Having sealed all-static components, device (Transistomatic) requires no maintenance or parts replacement.—*Western Precipitation Corp., 1000 W. 9th St., Los Angeles.* (156E)

Green-Bean Grader (horizontal bar-type) handles whole beans at 3,500-4,200 lb. per hr., cut beans at 4,000-5,000 lb. per hr. Employing a new operating principle, unit (Bar-Type Grader) size-grades by diameter and according to US Standards. It is available as a single or double machine for two and three separations respectively.—*Food Machinery & Chemical Corp., Canning Machinery Division, P. O. Box 1120, San Jose, Calif.* (158A)

Circle Key Numbers on Reader Service Card

EQUIPMENT APPLICATIONS

Case Loader Is Adjustable For 3- and 6-Pack Cartons

By handling the new three-pack beer cartons, as well as the regular six-packs, this case loader does double duty at P. Ballantine & Son's Newark brewery.

Reportedly the first of its kind, the convertible unit (Packomatic, J. L. Ferguson Co., Joliet, Ill.) loads 8 six-pack cartons or 16 three-packs (12 oz. cans) into corrugated shipping containers. Then, it upends filled cases for conventional sealing. Operation is fully automatic, eliminating manual upending and placing of filled cases on conveyor.

Although designed primarily for brewery use, this loader can be custom-engineered for other multi-can packs, such as beverages, vegetables, and soups.

Circle 158B on Reader Service Card

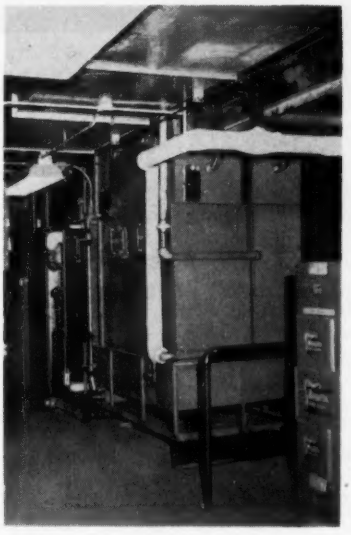
Equipment & Supplies

Automatic Dock Levelers Ease Material Handling

Problem of receiving heavy, unitized loads at Giant Food Stores, Wash., D. C. has been solved with use of adjustable dock boards. Thus, economies of forwarding palletized loads directly from suppliers and distribution warehouses are being fully realized.

Actuated by incoming trucks, dock boards adjust to carrier floor height to permit efficient unloading by power truck. No dock attendant is required. Units (Hi-Lo Automatics, Kelley Co., 211 W. Mill Rd., Milwaukee) are operated by a simple counterweight system with no electrical or hydraulic requirements for components.

Circle 159A on Reader Service Card



Controls Relative Humidity Of Nine Storage Areas

Proper storage of various candies at E. J. Brach & Sons' five-story Chicago warehouse requires nine different 'climate' areas.

This control has been achieved by a chemical-type dehumidifier that delivers air to exact specifications of relative humidity. Units (Kathabar, Surface Combustion Corp., 2382 Dorr St., Toledo, Ohio) maintain the precise storage atmosphere needed in each area.

Furthermore, they can be adjusted to meet future requirements of new products.

Circle 159B on Reader Service Card

Humid cleaning room

proves this hoist can take it

Sterilizing metal meat trays is hot and humid business. That's why this meat packing plant uses the Keller 86-1V10, ½-ton air hoist. It dips rack after rack of trays into scalding water and is unaffected by splashing, steam and high humidity. The 86-1V10 provides a swift, steady lift . . . gentle starts and accurate stops to keep cleaning job moving along.

Keller air hoists in capacities from 150 lb. to 2 tons. Write for Bulletin 80.

ENGINEERING FORESIGHT—PROVED ON THE JOB
IN GENERAL INDUSTRY, CONSTRUCTION, PETROLEUM AND MINING

GARDNER DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

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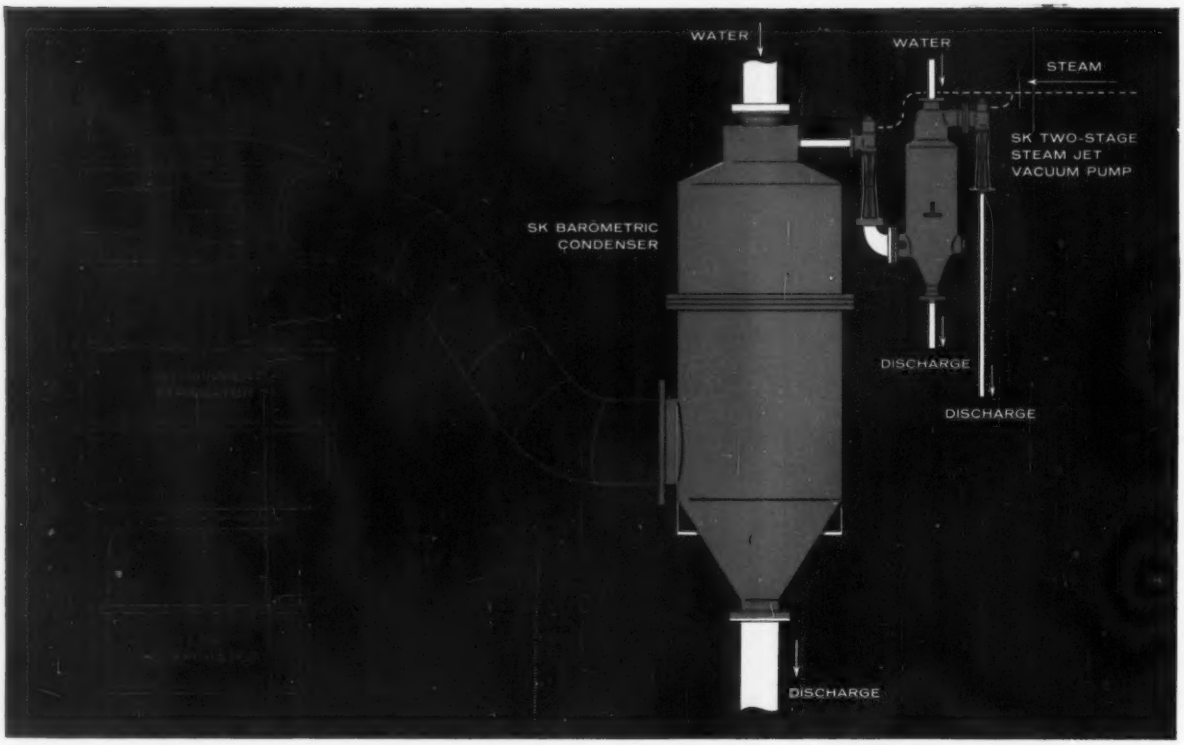


SK VACUUM PUMP HELPS BEVERAGE COMPANY

make better product at lower cost

SK Two-Stage Condensing Steam Jet Vacuum Pump

SK Steam Jet Vacuum Pumps utilize the kinetic energy of pressure steam to entrain and remove gases and vapors. Because they offer outstanding advantages—simple design with no moving parts, low initial cost, and long life expectancy with little supervision or maintenance—they have opened a whole new field for application in the food and allied industries.

A typical example is shown above. This is part of a refined, improved process developed by a popular beverage manufacturer for handling product. The two-stage steam jet vacuum pump illustrated consists of two exhausters with a barometric counter-current intercondenser. It is used to maintain an absolute pressure of approximately 1 inch of mercury on a system consisting of a single effect evaporator together with an entrainment eliminator and an SK barometric counter-current pre-condenser. The condensable vapors are removed in the pre-condenser and the two-stage vacuum pump handles the non-condensable gases plus moisture of saturation. Two single-stage exhausters are used on a section of the process not shown to maintain vacuum on a deaerator and a holding tank.

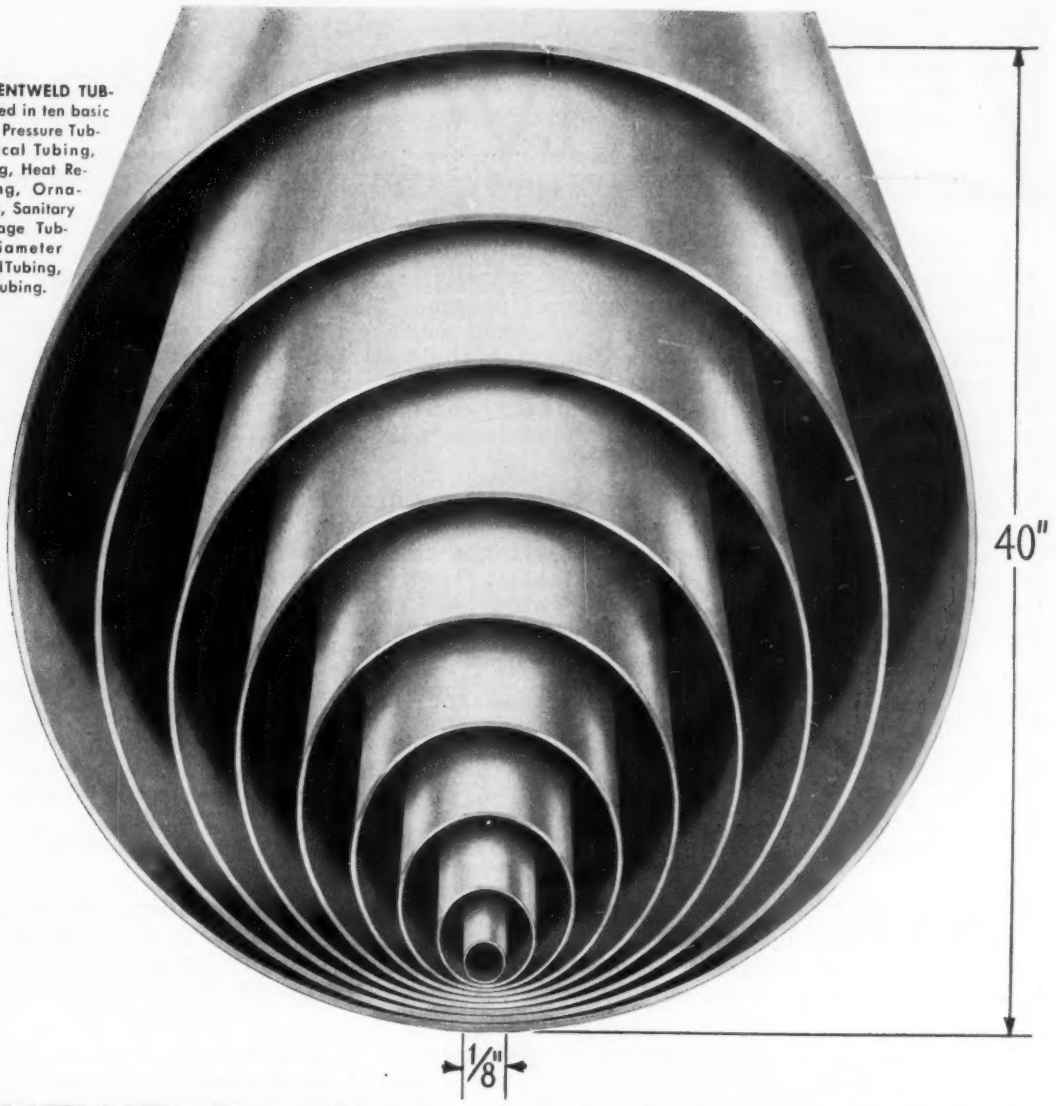
The improved process is outstanding in increased efficiency and control of product. And the SK Vacuum Pump has helped make it so.

Many sizes of Vacuum Pumps are carried in stock by SK and are available for immediate delivery. For material on Vacuum Pumps and for information on other types of SK Jet Apparatus, write for a copy of Bulletin J-1.

JET APPARATUS: Ask for Condensed Bulletin J-1.
ROTAMETERS & FLOW INDICATORS: Ask for Condensed Bulletin 18-RA.
VALVES: Ask for Condensed Bulletin V-1.
HEAT TRANSFER APPARATUS: Ask for Condensed Bulletin HT-1.
GEAR PUMPS: Ask for Bulletin 17-A.

Schutte and Koerting
COMPANY
MANUFACTURING ENGINEERS
2223 State Road, Cornwells Heights, Bucks County, Pa.

CONTOUR TRENTWELD TUBING is furnished in ten basic classifications: Pressure Tubing, Mechanical Tubing, Aircraft Tubing, Heat Resistant Tubing, Ornamental Tubing, Sanitary Tubing, Beverage Tubing, Large Diameter Tubing, Shaped Tubing, and Formed Tubing.



TRENTWELD tubing is equal in strength and has more uniformity than tubing made by any other method of manufacture

Trent offers tubing in sizes ranging from ⅛" to 40" O.D. and in a wide range of grades. These include: Hastelloy,* Zirconium, Zircaloy, Titanium and 10-9-DL grades. All are made by an exclusive welding process—Contour Trentweld®—which virtually eliminates the bead. Furthermore, by cold working and annealing after welding, Trent makes the weld equal in strength and corrosion resistance to the parent metal.

To insure that Trentweld tubing is of the highest quality attainable, a rigorous quality control program is carried out. Samples of each lot are tensile tested. Periodic tests — flattening, reverse bend, flare and flange, coil, and pressure — are conducted. Rigid corrosion tests are made on all lots intended for corrosive applications. When requested, a unique "single-wall" X-ray inspection is made as your final assurance of a sound, uniform product.

Why not take advantage of Trent *quality* when you order stainless or high alloy tubing? For further information, write for the Trent tubing handbook, Trent Tube Company, East Troy, Wisconsin.

*Trademark of Haynes, Stellite Co.

CONTOUR TRENTWELD

TRENT TUBE COMPANY

Subsidiary of Crucible Steel Company of America

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MILLS: EAST TROY, WIS.; FULLERTON, CALIF.

For more data, circle this page number on card at back →

Accent Flavor-Gram

CAPSULED NEWS FROM THE WORLD OF FLAVOR

✓ HOW SEASONED SAUSAGE CAN SPAN THE SEASONS. Flavor changes have always been the problem in storing frozen seasoned sausage. That is, until recently. In flavor testing, a researcher* found that seasoned sausage did not stay as palatable as unseasoned sausage at 0°F. However, with the addition of glutamate to the formula, the seasoned sausage was more palatable than the unseasoned variety after 4 months of storage and through the rest of the 12-month test.
*James D. Kemp, U. of Ky., "Food Technology," 1955, Vol. IX, No. 5, Pgs. 340-1.

✓ WHAT MONOSODIUM GLUTAMATE WON'T DO. Monosodium glutamate is not a panacea for unpleasant flavor factors—it won't make bad foods taste good. But it does have the amazing ability to suppress undesirable characteristics in some foods. For example, it gets rid of the metallic flavor in spinach . . . the "off" flavor that develops in shelf-aged tomato juice . . . earthiness in potatoes, and the fishy note that's often present in lima beans.

✓ NO "WARMED OVER" FLAVOR IN PRE-COOKED FROZEN FOODS. Three advantages the use of monosodium glutamate gives to the processors of pre-cooked frozen foods are indicated by studies made by the Quartermaster Food and Container Institute for the Armed Forces.* These studies indicate that monosodium glutamate prevents development of "warmed over" and other "off" flavors during storage, and helps the treated product retain original color and freshness.
*Nell M. Snavely, Second Symposium on Monosodium Glutamate (Chicago 1955).

✓ THE FLAVOR INTENSIFIER THAT GOES 'ROUND THE WORLD. The same monosodium glutamate with which food processors in the United States are familiar is used in the processing of dry soups in Switzerland. Food stores in Singapore give it big shelf space. In Antwerp, soup vendors add it to soups sold door-to-door.

✓ THE PROOF OF AN INGREDIENT IS IN THE BUYING. If you were to look in retail stores, you would find monosodium glutamate listed on the labels of some 8,000 processed and prepared food items. This gives you some indication of the size and importance of Ac'cent, the one widely available brand of pure monosodium glutamate, as an ingredient in food processing. Processors use Ac'cent because it improves the flavor-acceptability of canned, packaged and frozen foods, without adding flavor of its own. And because Ac'cent is stable, it holds these natural flavors throughout processing and shelf life.

✓ FLAVOR IS THE MAIN BUSINESS OF AC'CENT•INTERNATIONAL. These monthly reports on new developments and happenings in the Food Processing Industry are just one of the many services we offer you. As the American pioneer of monosodium glutamate, let our experience, our qualified personnel, research and technical facilities help you solve your flavor problems. If you would like to know more about the news items reported here, just drop a line on your letterhead to Technical Service Dept., Ac'cent•International, 20 N. Wacker Drive, Chicago 6, Ill.

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JUST OFF THE PRESS

PLANT ENGINEERING

Dust, Products Collectors

Describes units for applications where air is used to handle material. Bulletin 150-A, 4p.—*Sprout, Waldron & Co., Inc., Muncy, Pa. (163A)*

Milk Bottle Washers

Treats of heavy duty hydro milk bottle washers, with diagrams, specifications, and dimensions. Bulletin G-536, 8p.—*Cherry-Burrell Corp., Chicago. (163B)*

Nitrogen Generators

Describes new self-contained packaged nitrogen generators. Bulletin N-557, 4p.—*Gas Atmospheres, Inc., Cleveland. (163C)*

Immersible Motor

Complete information on new motor for submerged operation. Bulletin 2300—*The Louis Allis Co., Milwaukee. (163D)*

Pumps

Flier on centrifugal pumps designed for continuous heavy-duty operation within the medium pressure range. Form 7148-A—*Ingersoll-Rand, N.Y.C. (163E)*

Silent Chain Drives

Comprehensive book on silent chain drives contains detailed engineering data, illustration and tables of service factors, ratings, chain length and center distance computations. 88p.—*Link Belt Co., Chicago. (163F)*

Rotary Valve

Fact sheet describes various applications and types available. Bulletin N-578, 2p.—*The Day Sales Co., Minneapolis. (163G)*

Limit Switch

Announces new precision switch which can be replaced in seconds. Bulletin 20, 4p.—*Micro Switch, Freeport, Ill. (163H.)*

Condensers

Describes low-level condensers for steam under vacuum, at ground level. Bulletin 5 AB, 8p.—*Schutte & Koerting Co., Cornwells Heights, Pa. (163I)*

Motors

Discusses totally-protected 1-125 hp. A-C motors. Bulletin B-2506, 4p.—*Reliance Electric & Engineering Co., Cleveland. (163J)*

Variable Speed Drives

Concerns complete line of motor drives with wide speed variation, space economy. Contains speed and hp. tables, dimensions, assemblies, accessories, installation data, engineering information. 70p. catalog M-571—*Reeves Pulley Co., Columbus, Ind. (163K)*

Food Freezing Systems

Reprint of technical article discusses 4 packaged systems.—*Freezing Equipment Sales, York, Pa. (163L)*

Water Softener

Adaptability, flexibility, and efficiency of new zeolite water softeners described. 28B7107A—*Allis Chalmers Mfg. Co., Milwaukee. (163M)*

Temperature Regulators

Two series of steam regulating valves with pilots for fast and slow heat exchangers. Bulletin No. 1012, 6p.—*Spence Engineering Co., Inc., Walden, N. Y. (163N)*

Air Compressors

Concerns unit and stationary air compressors in sizes from ½ to 100 hp. Bulletin SG-1—*LeRoi Div., Westinghouse Air Brake Co., Milwaukee. (163O)*

Stainless Fittings

Illustrates, describes, gives dimensions of 30 stainless fittings for CIP and take-down line. Also tools for installation of ferrules. 12p.—*APV Co., Inc., Buffalo, N. Y. (163P)*

Thickness Gages

Outlines method for determining extent of corrosion or buildup on pipe walls. N.I. 157, 7p.—*Industrial Nucleonics Corp., Columbus, Ohio. (163Q)*

Glass Pipe & Fittings

Comprehensive illustrated manual on Pyrex brand double-tough glass pipe and fittings is divided into three sections—design, engineering, installation. Bulletin PE-3, 44p.—*Corning Glass Works, Corning, N. Y. (163R)*

Speed Reducer

Shows how shaft-mounted unit allows speed reduction with maximum flexibility. 7p.—*Gear Motor & Transmission Div., General Electric Co., Schenectady, N. Y. (163S)*

Automatic Boiler

Concerns packaged units for both air- and pressure-atomizing for oil and gas. Bulletin 1241, 6p.—*Orr & Sembower, Inc., Reading, Pa. (163T)*

Plastic Laminate

Information on corrosion resistant plastic laminate applicable to any surface having almost any contour. Bulletin AD-152—*United States Gasket Co., Camden, N. J. (163U)*

Welded Tubing

Explains advantages of welded tubing and supplies details on mechanical properties. TB-419, 8 p.—*Tubular Products Div., Babcock & Wilcox Co., Beaver Falls, Pa. (163V)*

PROCESSING

Stainless Kettles

Concerns units for every mixing and cooking need. Form 3547—*Hamilton Kettles Div., Brighton Corp., Cincinnati. (163W)*

Mixing Operations

Concerned with continuous mixing operations and machinery related to them. 4p.—*Rietz Manufacturing Co., West Chester, Pa. (163X)*

Stainless Pumps

Describes and illustrates new positive displacement, twin lobe pumps with capacities from 0-56 gpm. at 0-100 psi. 12p.—*Manton-Gaulin Mfg. Co., Everett, Mass. (163Y)*

Process Vat

Fact sheet pictures and describes pressure process vat in capacities of 500, 800 and 1,000 gal. Bulletin 962, 2p.—*The Pfaudler Co., Rochester, N. Y. (163Z)*

Separator Catalog

Describes new 30" SWECO vibrating screen separators. Bulletin S574-I, 4p.—*Southwestern Eng. Co., Los Angeles. (163AA)*

Pipe Heaters

Data on new pipe heater with electrical resistance wires sealed in waterproof polyvinyl chloride. 6p.—*Arthur S. LaPine & Co., Chicago. (163BB)*

Expanded Metal

Handy reference and buying guide for expanded metal. Bulletin 20-4, 7p.—*Joseph T. Ryerson & Son, Inc., Chicago. (163CC)*

Hot Pipe Insulation

Photos and drawings of cast-in-place monolithic insulation. Brochure Z-1, 11p.—*Z-Crete Div., Zonolite Co., Chicago. (163DD)*

High Pressure Pumps

Sanitary pumps for high pressure liquid transfer, metering and spray drying systems. Bulletin G-537, 4 p.—*Cherry-Burrell Corp., Chicago. (163EE)*

Operating Manual

Booklet contains exploded views, operating instructions, maintenance tips and parts list for company's fillers. Possible sources of trouble are covered, with recommendations for their solution. 36p.—*Hope Machine Co., Philadelphia. (163FF)*

Flowmeters

Discusses principle and operation of new magnetic flowmeters. Pub. 12302, 4p.—*Fisher & Porter Co., Hatboro, Pa. (163GG)*

Slurry Feeder

Features, design, operation and technical data on a slurry feeder and reservoir. Pub. No. TP-10-M, 8p.—*Wallace & Tiernan Inc., Belleville, N. J. (163HH)*

Spray Blending

Describes with diagrams operation of comminutors accessory equipment for processing of solids, liquid slurries, pastes. 4p.—*The Cog Corp., Chicago, Ill. (163II)*

Rotameters, Flow Indicators

Pictures and discribes precision instruments for measuring, indicating, recording, and controlling flow of liquids. Bulletin M-I, 4p.—*Schutte and Koerting Co., Cornwells Heights, Pa. (163JJ)*

Bag Opening Procedure

How sugar bags can be opened to allow economical second usage. 3p.—*B. W. Dyer & Co., New York City. (163KK)*

Free Literature—Fast Way

Any of these very-latest catalogs, bulletins, or folders will be sped to you gratis. Just note here the specific literature you want, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service postcard — back of book. Then sign at the bottom and mail.

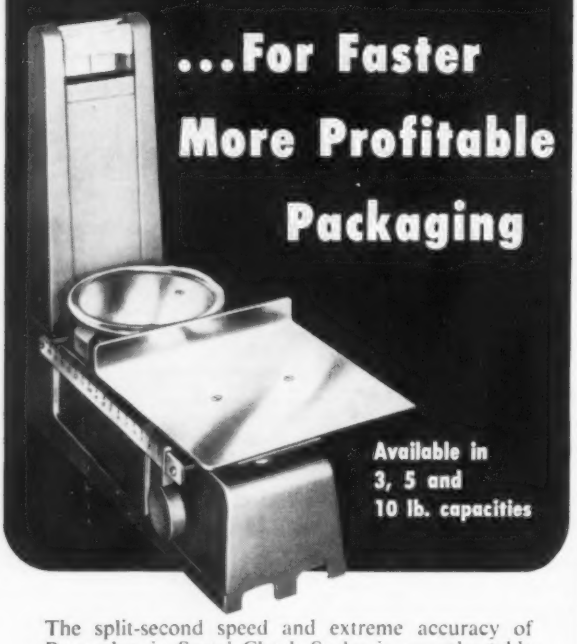
For your convenience, too, all items in this department are listed and keyed in the Reader Service Section.

When Your Profit is in the Balance

Pennsylvania

SPEED-CHECK SCALES

...For Faster More Profitable Packaging



The split-second speed and extreme accuracy of Pennsylvania Speed Check Scales is an unbeatable combination for saving time and eliminating human error in prepackaging operations. Precision engineered to insure more profitable production-line checkweighing. Pennsylvania Speed Check Scales provide you with the ultimate in speed, accuracy, compact portability and long maintenance-free operation. There's a model to meet every check-weighing need . . . whether you sell by the piece, the pound or the package.

- SPLIT-SECOND ACTION SPEEDS CHECKWEIGHING
- MAXIMUM READABILITY REDUCES HUMAN ERROR
- PERFECT ACCURACY IN OUT-OF-LEVEL POSITIONS
- NOT AFFECTED BY TEMPERATURE VARIATIONS

Golden Anniversary 1908 1958 PENNSYLVANIA SCALE COMPANY BAREVILLE, PA.

FOR OVER HALF A CENTURY . . . manufacturers of a complete line of precision scales for commercial, industrial and laboratory use.

FREE literature describing Pennsylvania's full line of Speed Check Scales will be sent you on request.

PENNSYLVANIA SCALE COMPANY
Bareville, Pennsylvania

MAINTENANCE

Clipper Seals

Concerns new Teflon clipper seals which allow positive sealing in presence of, and in contact with, active solvents and corrosives. 15p.—*Johns-Manville Corp., New York City. (164A)*

Steam Trap

Fact sheet describes improved float-thermostatic steam trap. Bulletin No. 455-B, 2p.—*Sarco Co., Inc., New York City. (164B)*

Sheet Packings

Details, specifications, application and test data on line of industrial sheet packings. No. P-328, 8p.—*Crane Packing Co., Morton Grove, Ill. (164C)*

Metal Gaskets

Features and design factors of spiral wound metal gaskets, plus types available. Bulletin #AD-104, 12p.—*Garlock Packing Co., Palmyra, New York. (164D)*

Polyvinyl Chloride

Facts and data on PVC pipes, sheets, rods, fabricated parts with chart showing wide range of proved applications. Technical Bulletin 80-3, 12p.—*Joseph T. Ryerson & Son, Inc., New York City. (164E)*

Metal Stitching

Information on stitching metal to metal or metal to non-metallic materials. AD 245 1057, 16p.—*Acme Steel Co., Chicago. (164F)*

Industrial-Truck Electricity

Short course in fundamentals of battery power for industrial trucks. 2p.—*Exide Industrial Div., The Electric Storage Battery Co., Philadelphia. (164G)*

Steel Tubing

Buyers and designers' guide to specially processed steel tubing for hydraulic cylinders and fluid lines. RM-6-10-7, 8p.—*Joseph T. Ryerson & Son, Inc., N.Y.C. (164H)*

QUALITY CONTROL

Laboratory Weights

Reviews construction and tolerance details for laboratory weights. Price list included. Bulletin W-57, 10M-9-57, 21p.—*Henry Troemner, Inc., Philadelphia. (164I)*

Analytical Processes

Explains nuclear magnetic resonance and other improvements in control and detection techniques. 8p.—*Schlumberger Well Surveying Corp., Ridgefield, Conn. (164J)*

Miniature Testing Units

Printed bulletin covers complete line equipment for solids determinations. 11p.—*Harry W. Dietert Co., Detroit, Mich. (164K)*

Refractometer

Discusses new high-accuracy refractometer. Bulletin No. 2290, 4p.—*American Instrument Co., Inc., Silver Springs, Md. (164L)*

Glass Tubing

Precision bore glass tubing and other specialties listed and described. Catalogue 80-20, 4p.—*Fisher & Porter Co., Hatboro, Pa. (164M)*

Scientific Apparatus

Lists makers of industrial instruments, laboratory apparatus and equipment, recorders, and controllers. 30p.—*Scientific Apparatus Makers Assn., Chicago. (164N)*

Lab Equipment

Illustrates, describes, gives technical data on new laboratory equipment. 19p.—*Scientific Glass Apparatus Co., Bloomfield, N. J. (164O)*

Burettes

Describes precision bore burettes that insure especially high accuracy. Catalogs 89-24, 3p.—*Fisher & Porter Co., Hatboro, Pa. (164P)*

SUPPLIES

Propionic Acid

New bulletin includes physical properties, specifications and applications. Bulletin F-40, 161A, 4p.—*Union Carbide Chemicals Co., New York City. (164Q)*

Protective Gloves

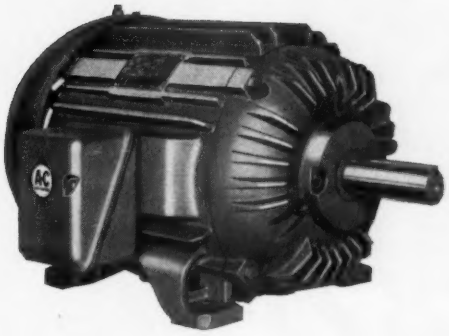
Describes gloves made of five types of molded rubber and synthetic materials. Bulletin 1310-2, 8p.—*Mine Safety Appliances Co., Pittsburgh, Pa. (164R)*

Vegetable Oil Ester

Describe oil-soluble surfactant for wetting, emulsifying, spreading and anti-corrosion. TB-No. 957-1—*Sole Chemical Corp., Chicago. (164S)*

Plastic Shim Stock

Details on new line of plastic gasket and shim stock with color and number code. No. 570, 4p.—*Chicago-Wilcox Mfg. Co., Chicago. (164T)*



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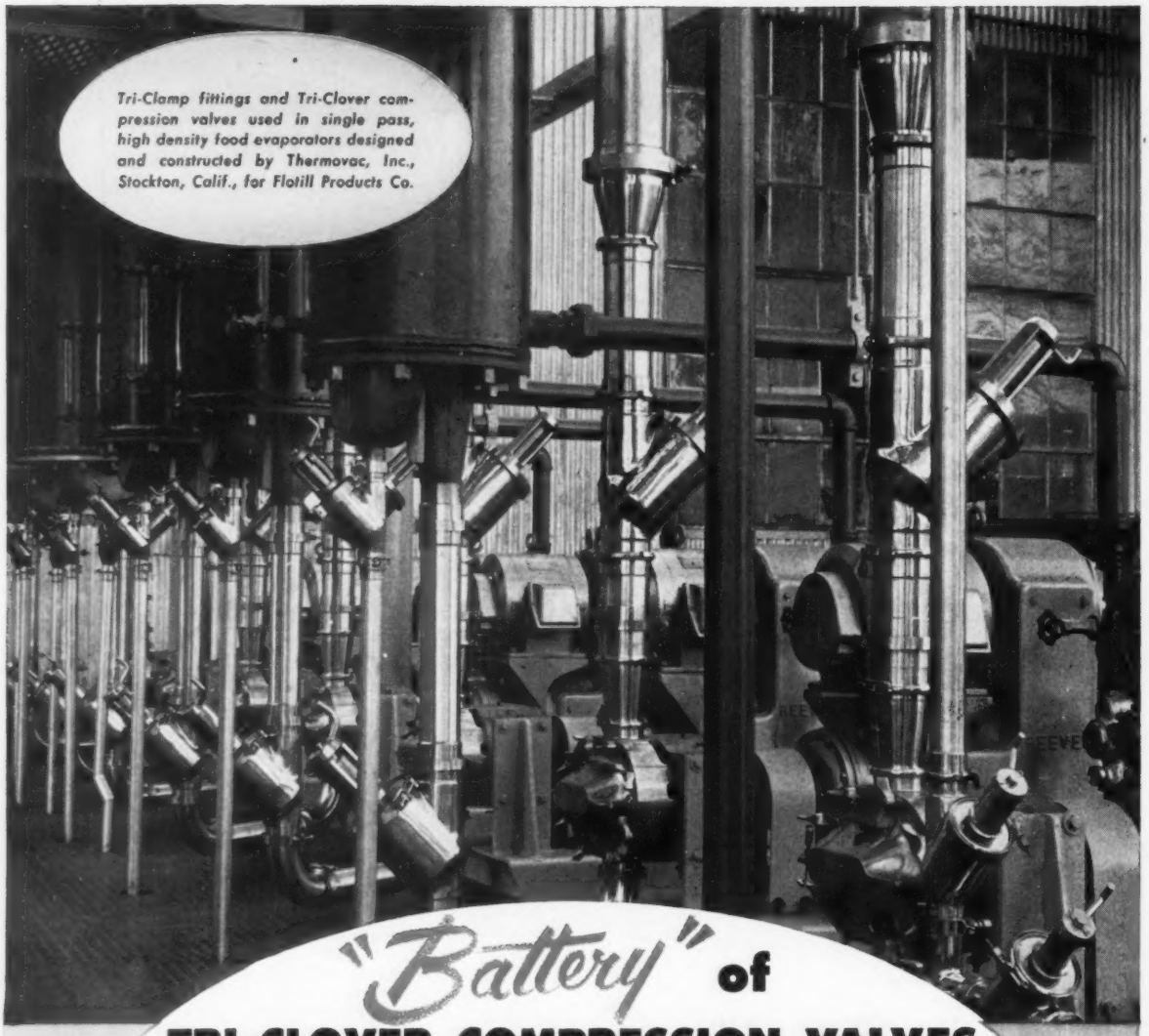

Tri-Clamp fittings and Tri-Clover compression valves used in single pass, high density food evaporators designed and constructed by Thermovac, Inc., Stockton, Calif., for Flotill Products Co.

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connected with TRI-CLAMP® Sanitary Fittings make compact—easy to clean installation at West Coast Cannery

This view is an excellent example of the way in which Tri-Clover Division's Tri-Clamp fittings and unions simplify and save space on what otherwise might be an extremely complex, hard to install, hard to clean piping and equipment arrangement. In this case, the Tri-Clamp fittings connect a large "battery" of Tri-Clover compression valves . . . one of the many types of sparkling-clean stainless steel valves and fittings used by food processors from coast to coast.

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S-457

SANITATION

Bakery Cleaning

Service manual on good bakery sanitation lists materials and procedures for cleaning equipment and controlling molds. Has equipment section illustrating specific units for different cleaning jobs. 38p.—*Oakite Products, Inc., New York City. (167A)*

Power Sweeper

Illustrated data sheet presents new features in sweeper line. *Form S-13.—Wilshire Power Sweeper Co., Glendale, Calif. (167B)*

Silicate Detergents

Folder describes industrial cleaning with Metso silicate detergents. Chart for 25 operations. 41-13-10m-957AD—*Philadelphia Quartz Co., Philadelphia. (167C)*

Floor Scrubbers, Polishers

Illustrates and describes Clarke floor maintainer that scrubs, waxes, polishes, etc. any kind or type floor or floor coverings. *Bulletin, Form 340 Revised, 4 p.—Clarke Sanding Machine Co., Muskegon, Mich. (167D)*

New Steam Cleaner

New type steam cleaner discussed with illustrations, specifications, job applications. *Bulletin No. 512H, 11 p.—Vapor Heating Corp., Chicago. (167E)*

Sanitation Products

Everything from floor finishes to soaps illustrated with complete and concise descriptions. Form No. 510L417, 44p.—*Huntington Laboratories, Inc., Huntington, Ind. (167F)*

PACKAGING

Metal Tubes

Complete data on proper selection and use of fold-up metal tubes. Covers every aspect of design, manufacturing and merchandising. 32p.—*A. H. Wirz, Inc., Chester, Pa. (167G)*

Package Machinery

Folder describes carton filling and sealing machinery. 8p.—*Food Machinery & Chemical Corp., Packaging Machinery Div., Philadelphia. (167H)*

Package Machinery

Brochure gives specifications, pictures and descriptions of new packaging units and systems, and information on improvements in company's standard line. 33p.—*Wright Machinery Co., Durham, N. C. (167I)*

Automatic Splicer

Describes web splicer that eliminates wrapping machines downtime.—*Butler Automatic Machine, Inc., New Canaan, Conn. (167J)*

MATERIALS HANDLING

Hand Trucks

Describes magnesium, two wheeled trucks and optional accessories. 4p.—*Brooks & Perkins, Inc., Detroit. (167K)*

Hand Lift Trucks

New design of hydraulic hand lift trucks, Bulletin 572. 4p.—*Barrett-Cravens Co., Northbrook, Ill. (167L)*

Comparison Chart

Comparison chart of various electric fork truck models.—*Lewis-Shepard Products, Inc., Water-Town, Mass. (167M)*

Portable Lift

Covers one-man portable lift units. Spec. Sheet No. 101B, 1p.—*Albert H. Cayne Equipment Corp., N.Y.C. (167N)*

Transmission

Describes new transmission for lift trucks which combines features of torque converter and fluid coupling. Bulletin 1399, 4p.—*Baker-Raulang Co., Cleveland, Ohio. (167O)*

Fork Trucks

Measures given for safer operation of fork lift trucks. 8p.—*Lewis Shepard Products, Inc., Watertown, Mass. (167P)*

Cost-Cutting Tips

Discusses problems involving different types of loads in a variety of industries.—*Towmotor Corp., Cleveland, Ohio. (167Q)*

Conveyor Systems

Guide for selection, installation and operation of conveyors. Bulletin 500, 19p.—*A. B. Farquhar Div., The Oliver Corp., York, Pa. (167R)*

Maintenance Booklet

Information on care and servicing of materials handling equipment in pocket-size manual.—*Towmotor Corp., Cleveland, O. (167S)*

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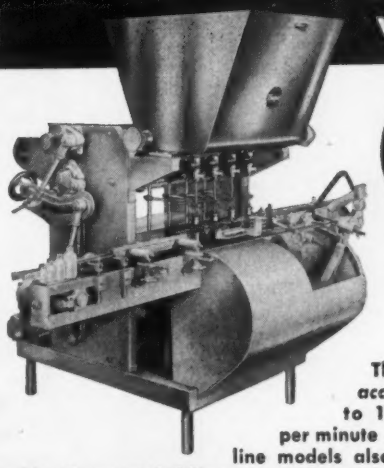

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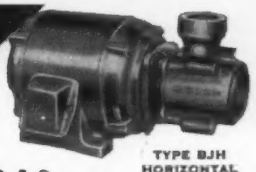

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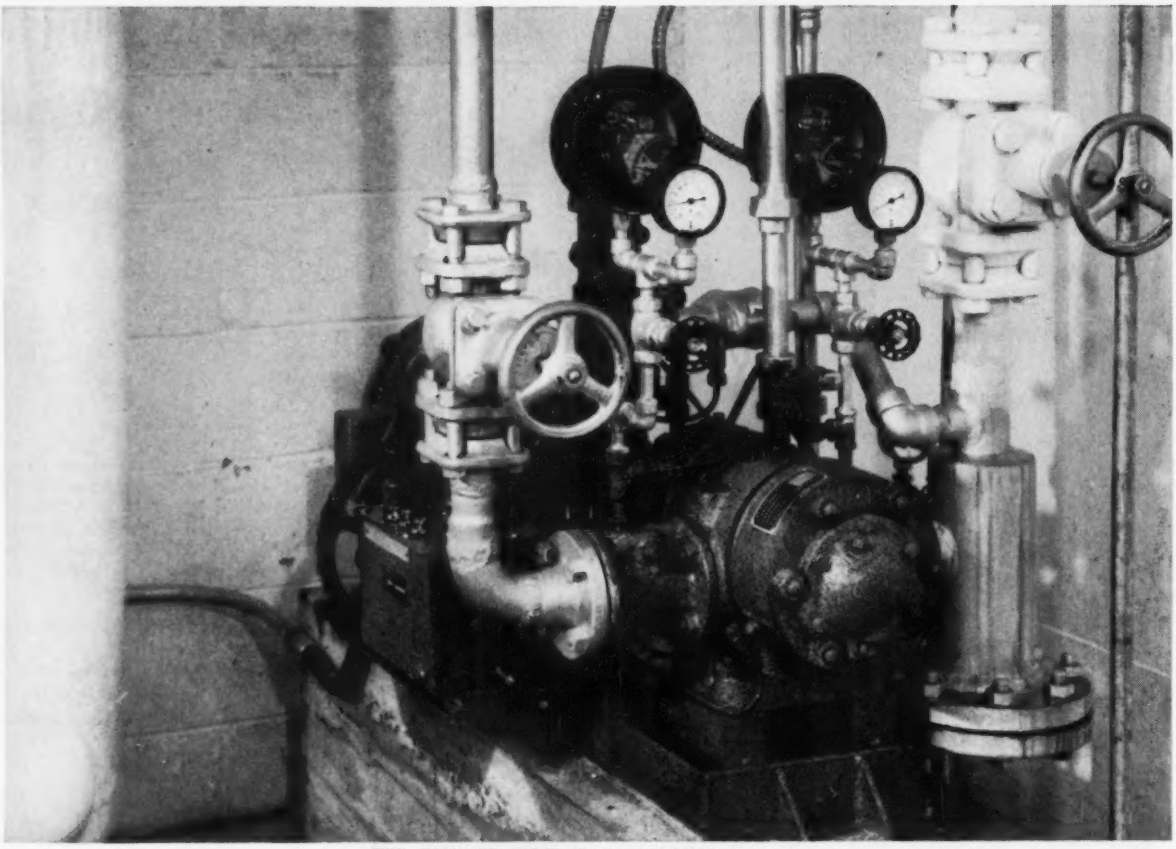

FES-FULLER ROTARY BOOSTER in service at Falter Packing Co., Columbus, Ohio. The Fuller rotary compressor has only three moving parts: rotor, bearings, and centrifugally-adjusted blades. Inset shows location of rotary next to refrigerant gas and liquid cooler.

How Falter Cut Expansion Costs $2300 with Fuller Low Temperature Booster System

One 7½ h.p. Fuller rotary booster makes possible the low-temperature storage of an additional 150,000 pounds of processed meats—in Falter Packing's recent 18,000-square-foot plant expansion.

Cost of a new reciprocating compressor to handle the increased load of the new cold storage room would have been about $6,000 (exclusive of piping). Entire cost, including installation, of the Fuller booster came to approximately $3,700. Cash saving: $2,300.

According to Carl Falter, Plant Superintendent:

"The simplicity of the FES-Fuller rotary appealed to our maintenance staff. Absence of valves, connecting rods and pistons will permit overhauling the entire unit in half a day. And its light weight, small size, lack of vibration meant it could be installed in an easily-spared corner of ordinary storage space."

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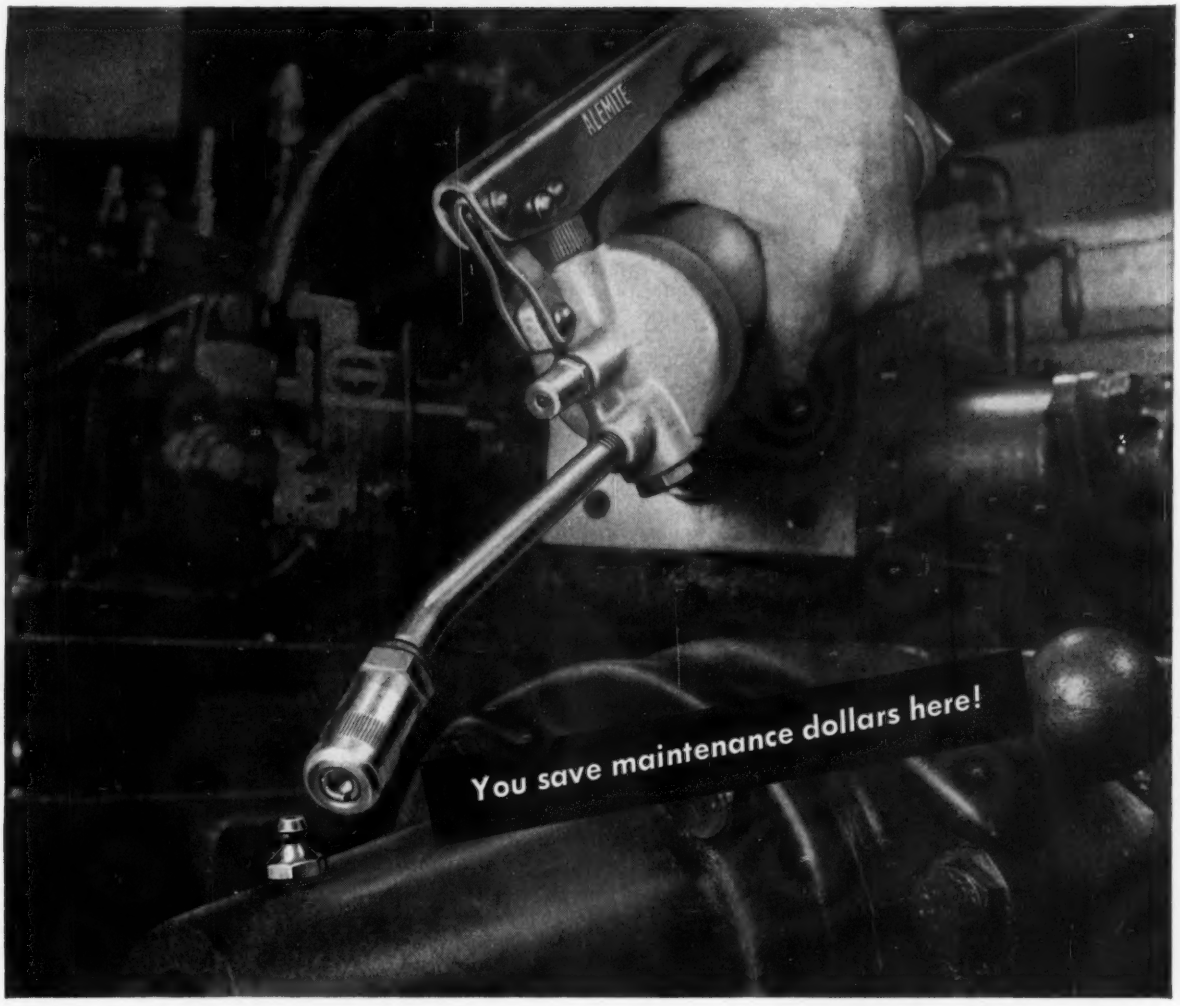

Alemite Hand Guns and Fittings Give You Up to 10,000 lbs. of Lubrication Power!

The point of lubrication is where maintenance costs can be cut—providing you have the right equipment for the job!

This heavy-duty Alemite hand gun—combined with genuine Alemite lubrication fittings—brings up to 10,000 lbs. of pressure to even ordinary lubrication points. It gives you power to spare for fast, efficient, money-saving protection of every machine in your plant!

Gun handles all regular pressure gun greases. Long operating handle for maximum leverage. Loader fitting permits fast, clean filling (or gun may be filled by suction). Heavy steel linkage for true piston alignment. Capacity, 1 lb. Get more out of man-hours and machine-hours with Alemite lubrication equipment!

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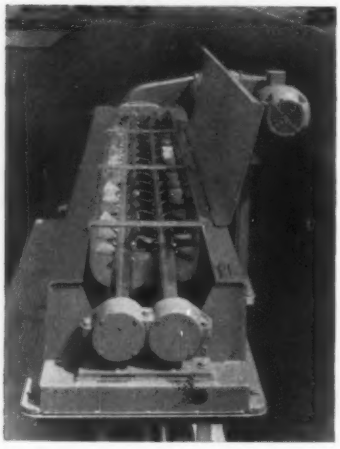

Anthony Continuous Mixers offer you truly profitable mixing performance.

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USEFUL NEW BOOKS

A $4 Billion Problem

BUILDING AND EQUIPMENT SANITATION MAINTENANCE. *Published by Association of American Soap and Glycerine Producers, Inc., 295 Madison Ave., New York City 17. 1957. Price: 75¢.*

Over 16 million manhours and $4 billion are the price management pays for building maintenance and sanitation. The figures are a good indication of how important good and efficient sanitation is in today's cost-conscious economy.

The book views modern sanitation as a highly organized, self-contained function performed by trained personnel responsible directly to management—whether in an industrial plant or office building.

Among topics covered are: Nature of the cleaning problem, types of cleaning materials, fitting the cleaner to the need, selection of cleaners, organizing the cleaning program, and determination of cleaning costs.

Charts and tables give quick access to such essential data as the recommended usage of different cleaning materials on different types of surfaces, time standards for floor maintenance operation and typical work routine in order of performance.

Concluding the book are brief accounts of nine outstanding examples of sanitation including National Biscuit Co.

Using the Ion Exchanger

ION EXCHANGERS IN ORGANIC AND BIOCHEMISTRY. *Edited by Calvin Calmon. Published by Interscience Publishers, 250 Fifth Ave., New York City 1. 1957. 761 pages. Price: $15.00.*

Rapid growth of the field of ion exchange has pointed up its great utility as a tool in organic and biochemistry. Both the ion exchange properties of the biochemical systems as well as the applications of conventional ion exchange materials to biochemistry and to organic chemistry are dealt with in this new work.

Some understanding of the material at the disposal of the worker and of the underlying principles of mechanism of ion exchange, plus data on the available techniques is also offered.

The first two sections of the book deal with the fundamentals of ion exchange in the techniques and apparatus used in carrying out the exchange and separation of ion. The third part deals with its application to specific aspects of organic and biochemistry.

A Look at a Basic Science

INTRODUCTION TO PROTEIN CHEMISTRY. *By Sidney W. Fox and Joseph F. Foster. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York City 16. 1957. 459 pages. Price: $9.50.*

A logical and unified discussion of the fundamental aspects of protein chemistry, the book indicates ways in which the knowledge is basic in other fields, particularly nutrition and food technology.

In step-by-step developments authors cover the amino acids, and peptizes and proteins in that order.

This balanced treatment should be of particular interest to food technologists.

Atom on the Farm

ATOMIC ENERGY IN AGRICULTURE. *By William E. Dick. Published by Philosophical Library, 15 E. 40th St., New York City. 1957. 150 pages. Price: $6.00.*

Compiled from papers presented at the International Conference on the peaceful uses of atomic energy held in Geneva in August 1955, this book discusses the myriad of uses of atomic energy in agriculture.

Among the uses discussed are the possibility of farmers obtaining a more abundant and widespread supply of electricity from atomic power stations, or the production of mutations induced when crop plants are subjected to atomic radiation. The author discusses radiation preservation and the use of radiation to destroy pests.

Refresher Experiments

EXPERIMENTS IN BIOCHEMICAL RESEARCH TECHNIQUES. *By Robert W. Cowgill and Arthur B. Cardee. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York City 16. 1957. 189 pages. Price: $3.50.*

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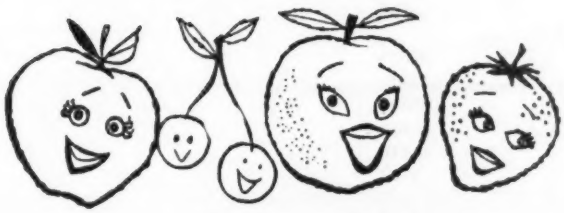
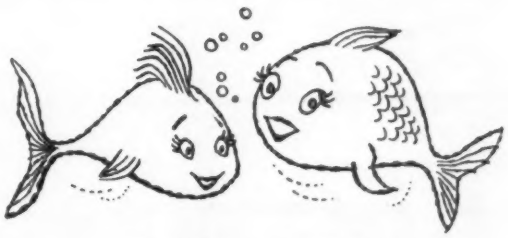
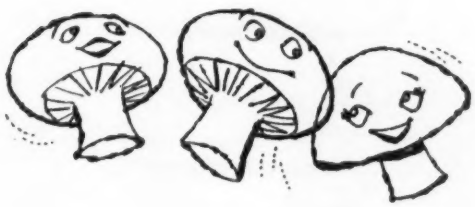


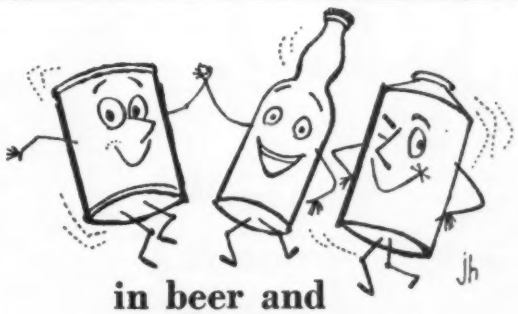
in frozen fruit



in frozen fish



in processed mushrooms



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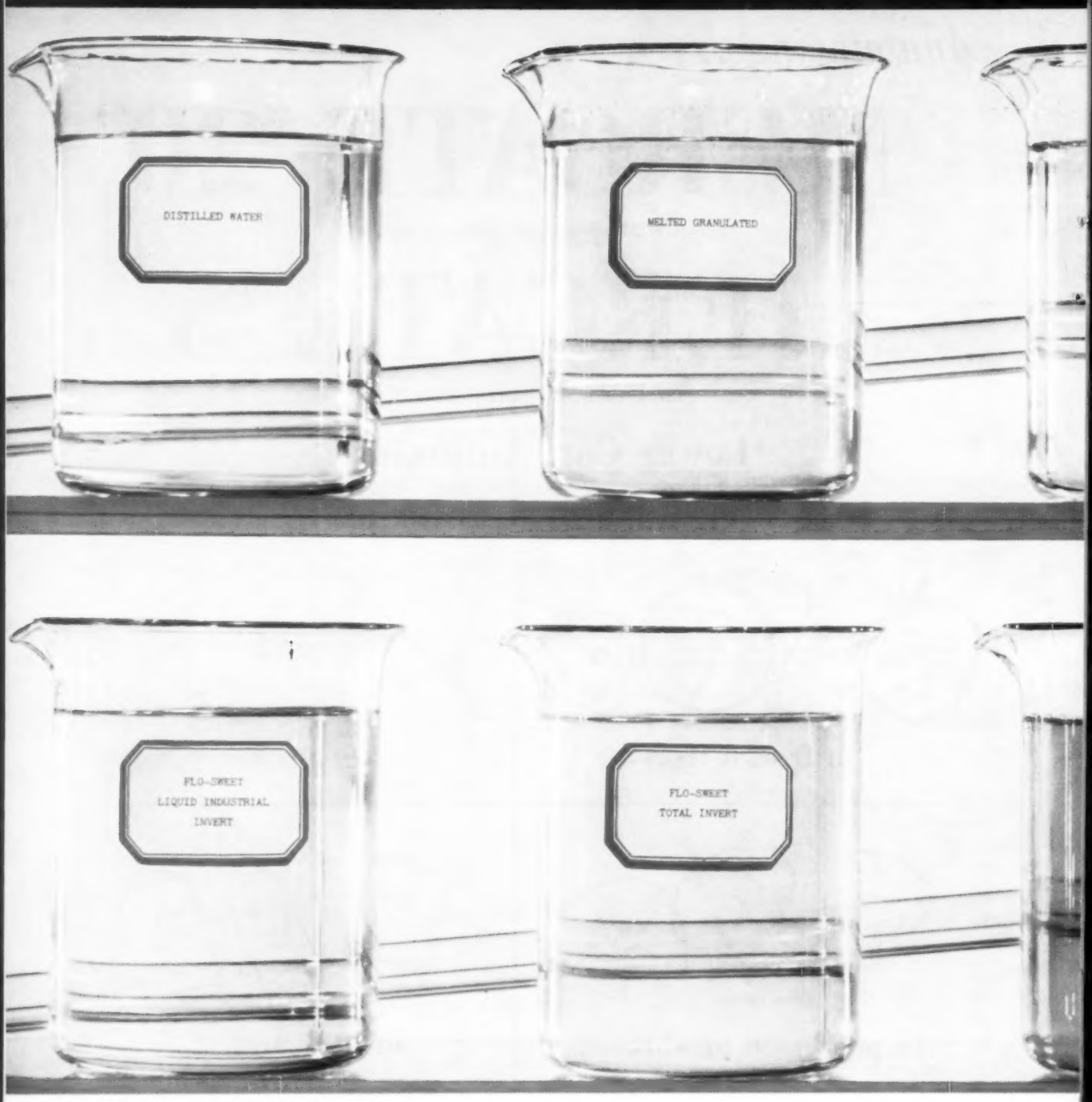

Color plates made from unretouched Ektachrome transparencies

This unretouched photograph reproduces the colors of the eight principal types of Flo-Sweet as precisely as possible with modern printing techniques.

Compare, if you will, Flo-Sweet liquid sucrose with distilled water. You can hardly tell the difference! Because color is a good indication of sugar purity, this is one proof of the efficiency of Flo-Sweet's refining techniques.

Note particularly the color of the melted granulated, shown at the same concentration of sugar solids as the liquid sucrose. This, we think, proves our contention that you can't get quality liquid sugar by mixing granulated with water.

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Refresher Reference

MANUAL OF NUTRITION. *Published by Philosophical Library, 15 E. 40th St., New York City 16. 1957. 70 pages. Price:* $3.50.

This is the fourth edition of a book first published in Great Britain in 1945. The work presents concisely and simply the principles of nutrition.

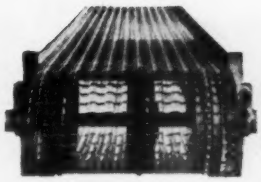
Rather basic for food technologists and experienced members of the industry, the book may however provide a quick refresher course for management men or new people in the food industry.

Booklets & Reports

ORGANIZATION AND ACTION FOR IMPROVED ADMINISTRATION (*Personnel Series* 173). *Published by American Management Association, 1515 Broadway, New York City 36. 66 pages. Price:* $1.75. Description of ways of improving company administration in the light of current changes in management patterns.

CONTROLLING EMPLOYEE BENEFIT AND PENSION COST. (*Special Report* 23.) *Published by American Management Association, 1515 Broadway, New York City 36. 1957. 127 pages. Price:* $3.75. Report discusses how a number of leading companies have solved this problem.

PROBLEMS AND PRACTICES IN ENGINEERING MANAGEMENT. (*Special Report* 24.) *Published by American Management Association, 1515 Broadway, New York City 36. 1957. 132 pages. Price:* $3.75. Illustrations of how companies have improved and clarified functions of the engineering organizations, by re-examination of techniques and application of new managerial practices.



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This endless belt provides a perfectly flat surface for containers, empty or filled. Made of best galvanized material obtainable. It's the most dependable and economical belt for every process and handling operation.

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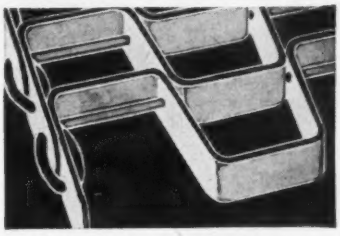

Available in ½" x 1"; also 1" x 1" in any length and practically any width.

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MAT AND MFG. CO.

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From One Engineer To Another...

from Problem to Gravy Train!

Our processing requires continuous cooking and cooling of various chicken, beef and other gravies . . . with and sometimes without starch . . . in a minimum space . . . with absolute protection of flavor . . . in a non-fouling system.

Case Histories Available on:
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Enter the APV ENGINEER . . .

with years of experience and know-how accumulated through serving the world's largest juice and food processors.

SOLUTION:

Use high efficiency APV Self-Cleaning Paraflow Plates that resist fouling. Quality of product is fully protected using recirculated hot water heating and water cooling. Operation is fully automatic, accurately controlled, economical . . . saves time, space, money.

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* Guarantee Sterility
. . . at LESS COST
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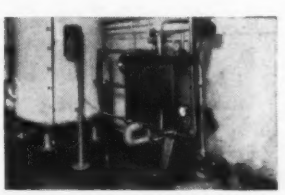
. . . in Continuous Flash Pasteurizing and Chilling Systems.



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Why settle for any but *the best*
when the ultimate success of your food or meat product,
beverage, confectionery or dessert,
may well depend upon its flavor?
To be sure you get the best, put your trust—
as so many other experienced buyers do—
in FRITZSCHE... *A FIRST NAME IN FLAVORS SINCE 1871.*

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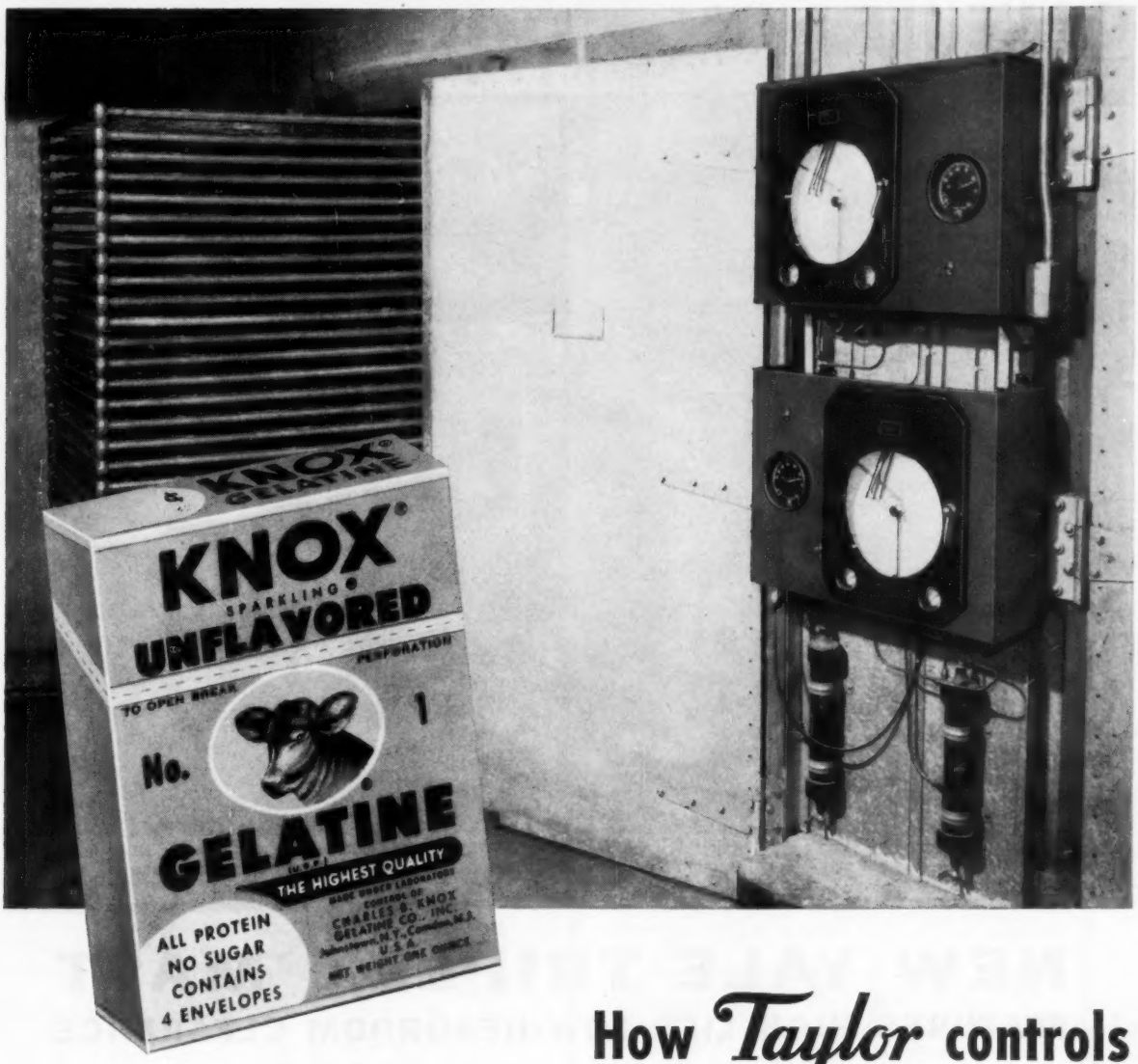

How *Taylor* controls help Kind & Knox keep quality high!

The Kind & Knox Gelatine Company knows that there's nothing so important to protecting profits as *careful, constant quality control.* And they believe that the name of Taylor is synonymous with quality control in the food industry.

In this case, Kind & Knox used two Taylor 121R FULSCOPE* Recording Controllers with adjustable sensitivity, to maintain even temperatures in their gelatin drying kilns. These FULSCOPE Recording Controllers have proven themselves to be ruggedly built, dependable in their performance, and easy to maintain.

Chances are that your process would benefit from a Taylor Control System. Why not see your Taylor Field Engineer . . . or write the Taylor Instrument Companies, Rochester, N. Y., or Toronto, Ontario.

*Reg. U.S. Pat. Off.

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VISION · INGENUITY · DEPENDABILITY

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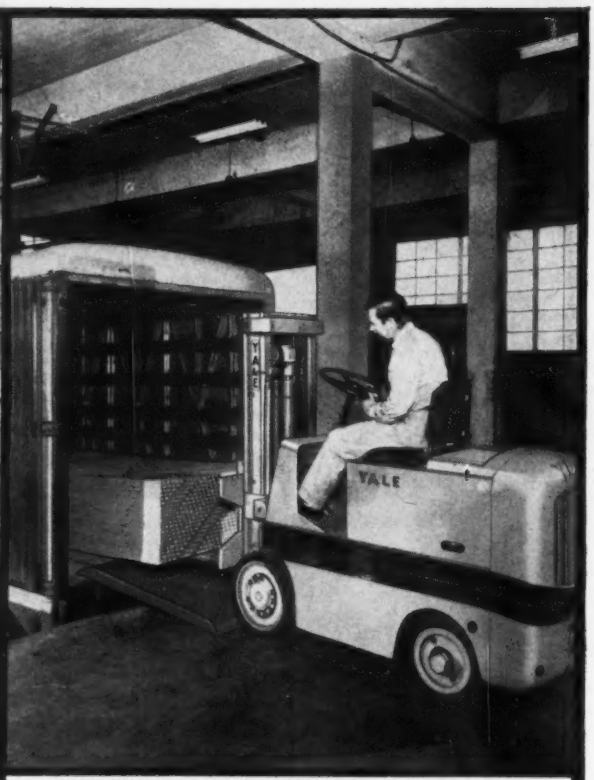
SAVE SPACE! Mast up! Stacks high, makes full use of air rights. Helps you get full value from every foot of your warehouse space.



SAVE TIME! Mast down! Allows truck to enter low-headroom areas – eliminating time-consuming re-handling operations.

NEW YALE TRIPLEX MAST

FEATURES HIGH LIFT, LOW-HEADROOM CLEARANCE

for fast, continuous handling operations

216"-HIGH REACH—96"-LOW SILHOUETTE

Boost storage capacity of present warehouse! Tier loads high as 216"! With mast up, take full advantage of air rights. With mast down, move safely into freightcars or trailer trucks –into any low-headroom area. Result: smooth, continuous flow of materials in and out of your storage, production and shipping areas.

New Yale Triplex Masts offer outstanding features – new interlocking I-beam construction for greater load stability—new open-front design that gives the driver full forward visibility.

Max. Fork Lift	108"	126"	144"	162"	180"	201"	216"
Collapsed Overall Height	59"	65"	71"	77"	83"	90"	96"

Capacities: 3,000, 4,000 and 5,000 lbs.

For full facts, write The Yale & Towne Mfg. Co., Philadelphia 15, Pa. Dept. A-462.

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INDUSTRIAL LIFT TRUCKS AND HOISTS

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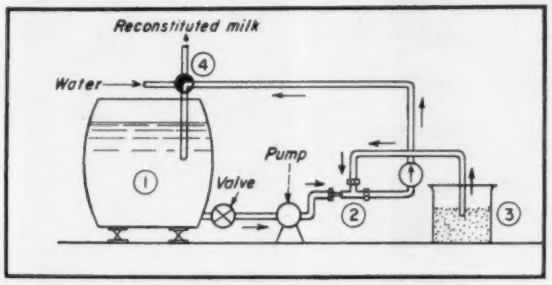


Milk Powder Reconstituted by Venturi Action

Refrigerated water from batch tank (1) is pumped through a venturi T (2), which creates a vacuum in line leading to milk-powder reservoir (3). Suction draws powder into recirculating stream, in which it dissolves. Reconstituted product leaves (4) through 3-way valve.—*L. A. Niemann to Milnot Co., Litchfield, Ill. No. 2,818,341. Dec. 31, 1957.*

PRODUCTS

Simulated Meat Spread Having Protein Filaments Bound by Chewy Protein Gel—Lever Bros. Co., N. Y. C. Nos. 2,813,024, 025, 794.

Antioxidant Solution Comprising Edible Oil, Fatty Monoglyceride Citrate, BHA, Propyl Gallate—Griffith Laboratories, Inc. No. 2,813,032.

Quick-Cooking Rice Made by Steeping Grain, Cooking, Cooling, Freezing, Thawing, Drying—Converted Rice, Inc., Houston, Tex. No. 2,813,796.

Fruit Composition Having Syrup Thickened With Carboxymethyl Dextran—Midland Chemical Corp., Dayton, Ohio. No. 2,813, 797.

Phytic Aicd Made by Contacting Aqueous Phytate Slurry With Cation-Exchanger (Hydrogen Cycle), Oxidizing Agent —Corn Products Refining Co., N.Y.C. No. 2,815,360.

Hops Powder Prepared by Infusing Hops With Softened Cold Water, Decanting, Boiling Purified Product in Lye Solution (pH 8-8.3), Filtering, Vacuum Drying—W. Heyer, Munich, Germany. No. 2,816,-032.

PROCESSING

Processing Frozen Meat by Molding, Thin-Slicing, Extruding, Slicing, Compacting, Packaging—T. T. Keane Co., Wash., D. C. No. 2,812,260.

Producing Light Fatty Acids by Refining Soap Stock—Archer-Daniels-Midland Co., Minneapolis. No. 2,812,343.

Deodorizing Fish by Extracting With Alcohol at pH 8 or Above — Lever Bros. Co., N.Y.C. No. 2,813,027.

Preparing Cheddar Cheese by Extruding the Curd, Ripening in Individual Flexible Containers—Armour & Co., Chicago. No. 2,813,028.

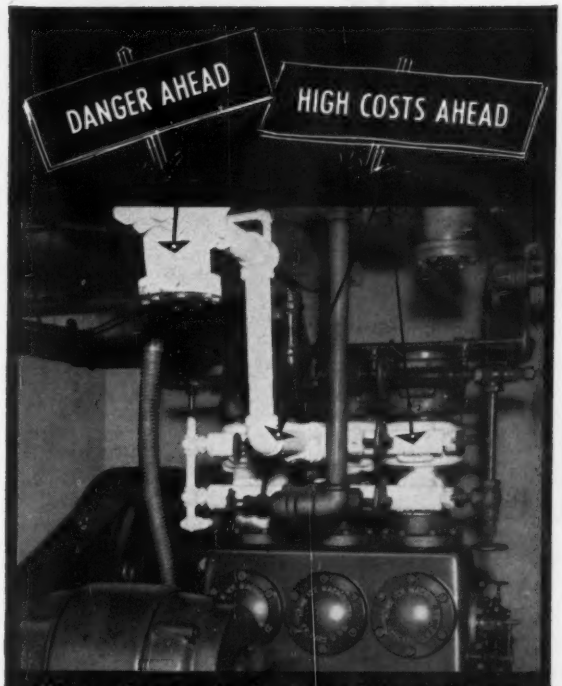
Want more information on any of these recent patents—if so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.

Processing Peanuts (Shelled, Raw, Red Skin) by Successively Treating With Corn Syrup, 315-F. Coconut Oil, Draining Through Strainer—R. O. Shirk, Bloomington, Ill. No. 2,-813,029.

Scalding Carcasses by Applying Pressure to Epidermal Outgrowth During Scalding—Barker Poultry Equipment Co., Ottumwa, Iowa. No. 2,-813,298.

Concentrating Solutions by Sublimation — Commonwealth Engineering Co. of Ohio, Dayton. No. 2,813,350.

Peeling Tomatoes by Freezing Superficially, Defrosting to Separate Skin—D. Cagnoni, Milan, Italy. No. 2,813,563.



That frost is lost refrigeration

DON'T LOSE REFRIGERATION . . . LET A PHILLIPS LIQUID AMMONIA RETURN SYSTEM SAVE YOU MONEY 7 WAYS

1. **Protects your compressor** — eliminates damage from slugs of liquid in the compressor chamber, cause of broken rods, broken heads, diluted lubrication, unnecessary wear.

2. **Increases compressor efficiency** — keeps properly conditioned vapor going through compressor, neither too hot nor too wet.

3. **Increases evaporation efficiency**—makes it safe and practical to flood coils fully, to have entire evaporation surface wet.

4. **No more lost refrigeration**—"slop-over" means refrigeration in the wrong place; this system returns stray liquid where it belongs, while it's still useful, increases peak capacity of the installation.

5. **Saves operator time**—with completely automatic operation, operator does not need to keep constant valve vigil.

6. **Speeds defrosting**—liquid can be drained quickly from coils into other parts of the system, just as rapidly returned to the coils after defrosting. Shutdown time is almost negligible.

7. **Saves maintenance** — with slop-over damage and overheating damage eliminated from compressor, repairs are minimized. Sludge is automatically collected in accumulators, too, for easy draining. More time between expansion valve changes, since slight leakage never reaches the compressor.

Several types of systems are available for gravity, injection-lift and pressure-lift operation, in sizes up to 1,000 tons. Let a Phillips engineer help you select the right system to assure complete protection and greatest efficiency of operation for you. Send for Bulletin LRS-56.

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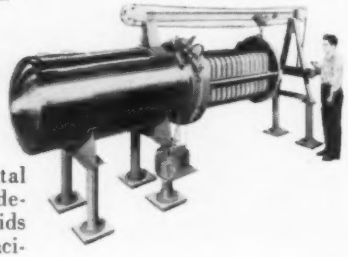
the most dependable name in

PRESSURE FILTERS

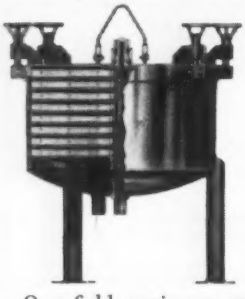
FOR LIQUID CLARIFICATION

Niagara vertical tank models are available in sizes up to 1000 sq. ft. Automatic cake discharge optional.



FOR CAKE RECOVERY

Niagara horizontal tank filters are designed for easy solids removal with capacities up to 250 cu. ft.



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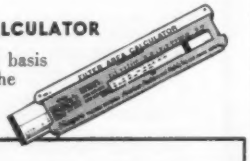
Niagara Batch-Miser® horizontal plate filters can be used with all types of filter media. Sizes 7.4 sq. ft. to over 200 sq. ft. in a single unit.

Our field engineers can provide you with an accurate and efficient appraisal of your filtration problem and a prompt recommendation of the filtration equipment best suited to your processing needs. Niagara's laboratories and field testing equipment are at your service. See our pages in Chemical Engineering Catalog.

FREE! NEW FILTER AREA CALCULATOR

Determines required filter area on basis of BOTH the *filtration rate* and the *cake capacity*. Write *today!*



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A DIVISION OF

American Machine and Metals, Inc.

Dept. FE-258, EAST MOLINE, ILLINOIS
(Niagara Filters, Europe: Kwakelpad 28, Alkmaar, Holland)

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EQUIPMENT

Bake Pan for Frankfurter Rolls—J. H. Dawson, Rockville, Md. No. 2,810,338.

Fowl-Suspending and Conveying Unit—Swift & Co., Chicago. No. 2,810,926.

Poultry Batch Scalder—Swift & Co., Chicago. No. 2,810,927.

Chocolate-Molding Conveyor Employing Spaced Endless Links, Pans, Connecting Pins, Guide Rail—Microvaerk A/S, Soberg, Denmark. No. 2,811,933.

Cross-Grain Adapter for Dough Molder—D. Harrell, Rolla, Mo. No. 2,811,934.

Spaghetti Cutter Employing Sweeping Table, Means for Transferring Dried Paste Strips, Removing Looped Portion, Bundling Short-Length Strands—Senzani Machinery Co., Lowell, Mass. No. 2,813,498.

Fruit Pitter Having Dies, Punchers, Resilient Dislodging Finger, Slotted Stripping Device, Discharge—Lindsay Ripe Olive Co., Lindsay, Calif. No. 2,813,561.

Can Crusher Consisting of Reciprocating Member, Crushing Head, Control—Nelson Bros., Inc., Fort Scott, Kan. No. 2,813,569.

Pickle Grader Comprising Elongated Frame, Top Platform With Opening of Increasing Width Toward Discharge End, Belt-Mounting Pushers—J. F. Steber and M. M. Scharf, Green Bay, Wis. No. 2,813,627.

Interleafer Adapted to Insert Paper Sheets Between Adjacent Food Slices—Package Enterprise, Inc., Oakland, Calif. No. 2,813,798.

PACKAGING

Sanitary Pouring Attachment (Non-Drip) for Cans and Jars—J. I. Thompson, Lansing, Ill. No. 2,810,498.

Forming Film-Type Packets Continuously While Filling With Sterilized Gelatinous Food—J. W. Armbruster, E. Rockaway, N. Y. No. 2,810,652.

Packaging Unit Employing Bag-Feeding, Opening, Filling, Scaling Means—British Sugar Corp., Ltd., London, England. No. 2,810,999.

Collapsible Egg Crate—Comprising End Walls With Upper Flanges, Engaging Cover, Straps, Handles—R. E. Draper Albion, N. Y. No. 2,811,275.

Solids-Dispensing Container Having Cutting Device to Form V-Shaped Opening—M. Donovan, Saugatuck, Conn. No. 2,811,281.

Meat-Wrapping Sheet for Frozen Storage Employing Moisture-Impervious Surface Coated With Tenderizing and Flavoring Agents—R. Pressman, Sierra Madre, Calif. No. 2,811,454.

Container for Leavened Dough Consisting of Circumferentially Scored Tube, Interliner, Tear Tape—Borden Co. No. 2,811,455.

Polymer Food Coating Comprising Vinylidene Chloride, Vinyl Chloride, Lower Alkyl Acrylate—Tee-Pack, Inc., No. 2,812,259.

Can Filler Having Endless Conveyor, Molds Consisting of Pivoted Arcuate Elements, Sprocket, Filling Station—G. H. Vaniman and C. O. Christensen. No. 2,812,785.

Automatic Drum Filling and Net Weighing System—California Research Co., San Francisco. No. 2,812,919.

Packaging Unbaked Cookies by Depositing on Carrier Sheets, Heating to Secure Pieces, Filling Into Container—E. Schneider, Mahopac, N. Y. No. 2,813,033.

Packing Individual Frozen Shelled Eggs by Filling Each Broken-Out Egg Into Sealable Film, Freezing—V. Rasky, N. Hollywood, Calif. No. 2,813,800.

Label-Applying Attachment for Bread-Wrapping Unit—Regan Bros. Co., Minneapolis. No. 2,814,328.

Suction Cylinder for Lifting Bag From Vertical Stack, Opening It—Trescott Co., Fairport, N. Y. No. 2,814,488.

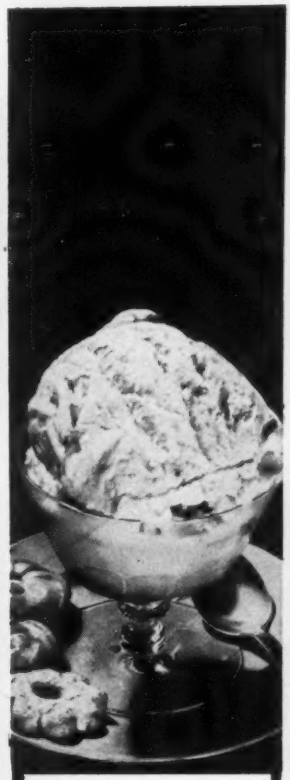
Sausage-Patty Packager Employing Molding Chamber, Reciprocating Slide, Plastic-Film, Supply Port—R. F. Beerend, Vermilion, Ohio. No. 2,814,921.

IN BREAD

Assures complete, controlled fermentation, enhances flavor and aroma, gives even texture, uniform grain, maximum retention of softness, longer shelf life.

IN CATSUP

Preserves piquant tomato flavor, enhances delicate spice flavors, protects the rich red color of all tomato products.



IN FROZEN DESSERTS

Assures firmer, finer-grained ice cream, with rich butterfat flavor—prevents surface crusting and preserves true fruit flavor in sherbets and water ices.

IN CANNED FRUITS

Enhances true fruit flavor, protects natural color, stabilizes the good eating qualities of fruits—adds appetite and sales appeal.

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BRAND DEXTROSE

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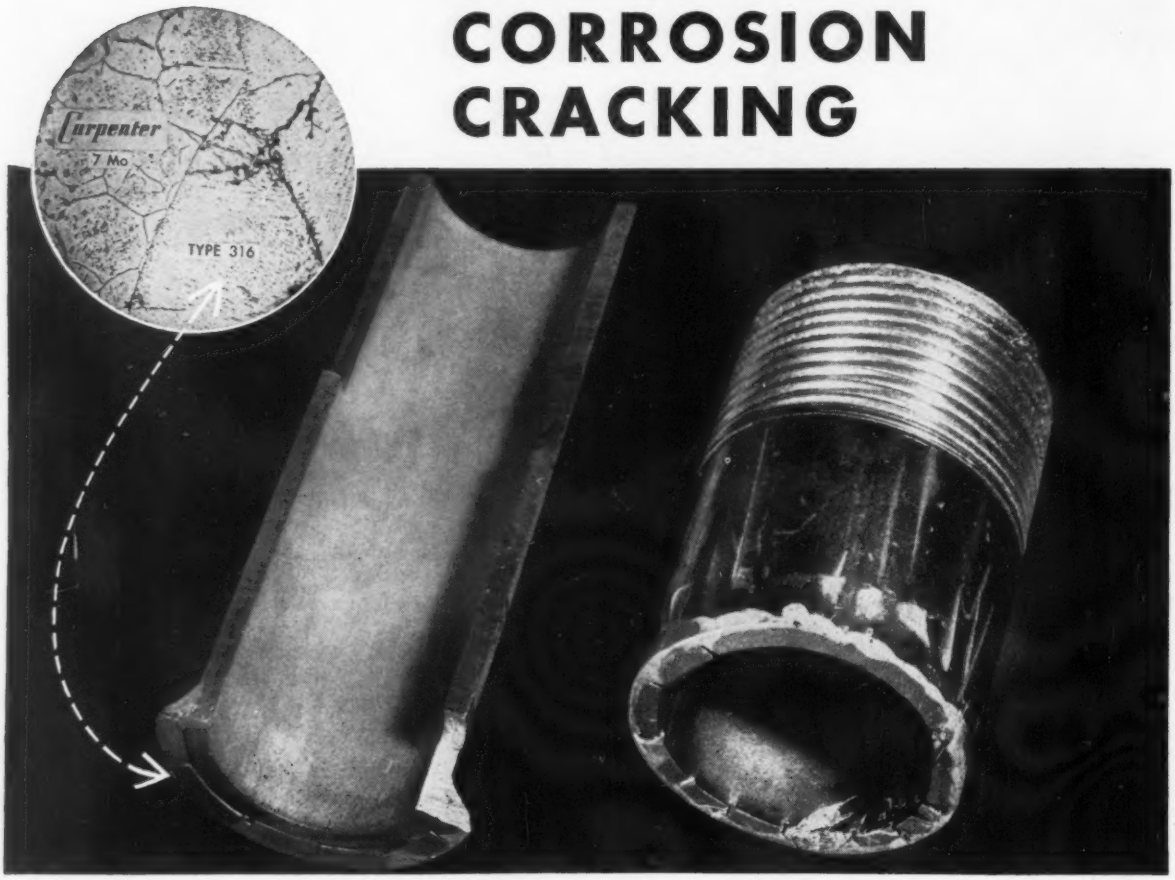
STRESS CORROSION CRACKING



Carpenter 7Mo Stainless Tubing & Pipe

Take a closer look at the above section of Carpenter 7Mo Stainless Pipe welded to a Type 316 fitting. See how stress corrosion cracking has ruined the fitting, just as it has destroyed the piece of stainless pipe at right.

Note how the cracks in the fitting stop abruptly when they reach the 7Mo pipe. And this pipe has already outlasted three such fittings. The photomicrograph shows the unmistakable proof.

If you have conditions where chlorides, caustic or sulphite solutions are present, Carpenter 7Mo's excellent resistance to general corrosion, pitting and stress corrosion cracking may prove to be a real cost-saver. Let's discuss your particular application now.

The Carpenter Steel Company
Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Write for this Carpenter 7Mo Technical Bulletin.

Carpenter
more than corrosion resistance
Stainless Tubing & Pipe

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FOOD PROCESSING SPECIALIST

Age 45 to 65, extensive operating background canning, dehydration and general food processing industry. Experienced with engineering, plant operation, processing methods, equipment, raw material supply, food sanitation and quality control. Knowledge of development of potential markets, sales methods and economics of operations. To act as consultant and adviser to foreign canning industry. Possibility of 24 to 30 months foreign service. Good salary and living conditions: quarters and travel allowance.

The J. G. White Engineering Corp.
80 Broad Street, New York 4, N. Y.

FOOD TECHNOLOGIST
for
TECHNICAL SERVICE

Position open for Food Technologist with experience in baking, particularly wholesale bread. Responsibility will include laboratory and customer contact.

Submit resume to:

Director
Technical Sales Service Department
CLINTON CORN PROCESSING COMPANY
Clinton, Iowa

MAN WHO LIKES TO WRITE

WANTED for advertising and sales promotion work. Must have at least three years of college with courses in engineering and technical subjects and ability to write. Position offers excellent opportunity. Previous experience helpful but not essential.

Man selected will be trained in all phases of industrial advertising. In your letter of application state age, education, positions held, and give statement of why you want a career in advertising.

Location: well-known Connecticut company.

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We have an excellent opportunity for a young Sales Engineer with experience in equipment used in the Dairy, Canning, Beverage industries and in hydraulics. Our product is nationally known, famous for its quality and performance, backed by national advertising and produced by a reputable organization of over a quarter century experience. Position is a permanent one with excellent future as West Coast representative, contacting distributors and users. Straight salary and expenses with car furnished by company. Write, outlining your education, experience, products handled and salary expected.

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Production & Research Chemist, with extensive experience in manufacture, development, control, of a wide line of confectionery and chocolate products, desserts, cereal products, and other foods, as well as laboratory direction, desires a position of responsibility. PW-7108, Food Engineering.

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For Lease—Complete vegetable and strawberry processing plant, and other modern processing machinery, including Package Machinery Corp. automatic wrapping machine, all housed in modern building located in center of industrial section of Central Arkansas. Quick Freezing Plant with 40 Tons daily capacity at —30°, and Cold Storage Warehouse with capacity of 300,000 cubic feet located on property and available for use, Railroad siding and truck dock available. For details write FL-6424, Food Engineering.

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WOULD BE PREPARED TO UNDERTAKE MANUFACTURE AND SERVICING OF MACHINES FOR FIRMS DESIRING OUTLET FOR THEIR PRODUCTS IN THE UNITED KINGDOM AND BRITISH COMMONWEALTH.

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Will buy for cash, closeouts and discontinued items, all types paper, containers, plastics—or what have you.

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Automatic spot labeler for glass; also automatic labeler for sizes up to 46 oz. cans. In good condition, not more than two years old.

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6—Room Blowers or diffusers

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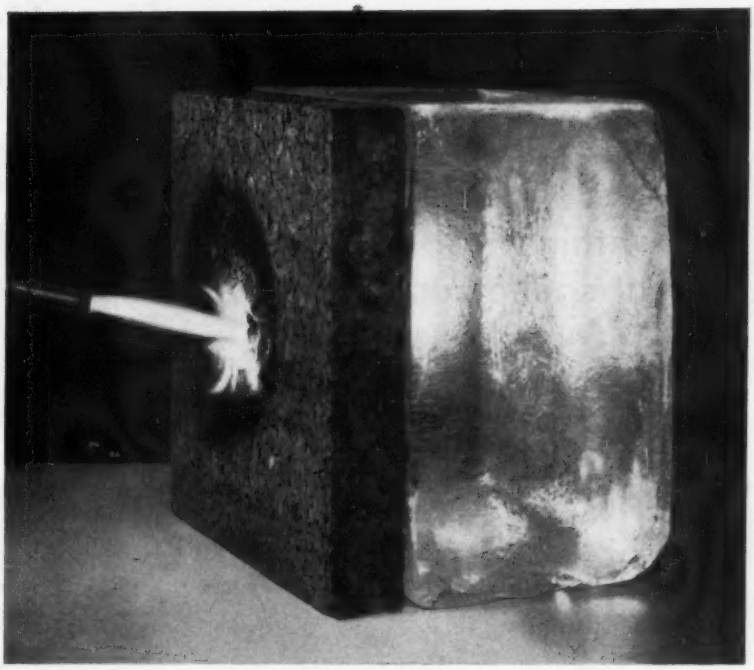

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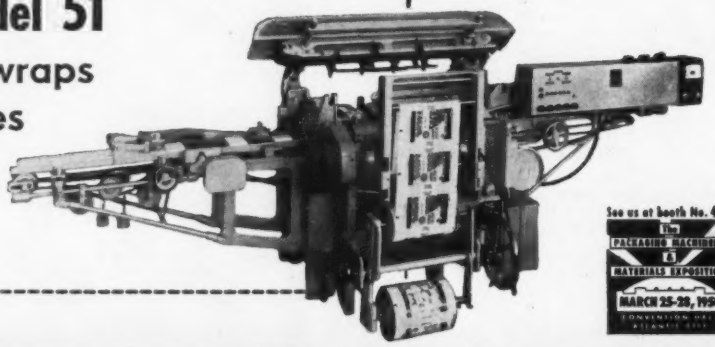

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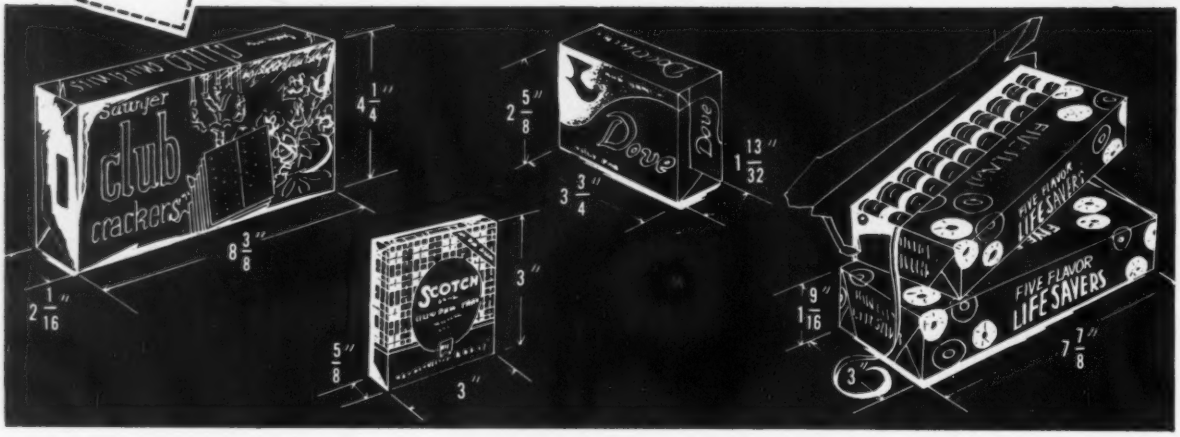

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